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NATURAL FERTILITY AMONG MONOGAMOUS AND POLYGYNOUS FAMILIES: A HISTORICAL DEMOGRAPHIC STUDY

by

©

HELEN COLBERT

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled NATURAL FERTILITY AMONG MONOGAMOUS AND POLYGYNOUS FAMILIES: A HISTORICAL DEMOGRAPHIC STUDY submitted by Helen Colbert in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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ABSTRACT

This dissertation tests the polygyny-fertility hypothesis by examining differential fertility and birth interval lengths of monogamous and polygynous nineteenth-century Mormon females who experienced natural fertility. It further examines the effects on polygynous fertility of the ordinal status of the wife, the percentage of married years spent in a polygynous union, and the average number of wives present in a union. Moreover, the effect on fertility of age differences between monogamous and polygynous spouses is examined as well as is marriage-cohort fertility. The data are drawn from Family Group Record Sheets housed in the L.D.S. Genealogical Archives, Salt Lake City, Utah. The sample consists of 1,896 females--932 of whom were always monogamous and 964 of whom were at some time polygynous.

Analysis of the data revealed that, for those continuously married through age 46, polygynous fertility was depressed by approximately 1.0 relative to monogamous fertility, not a great difference when it is recognized that the average monogamous female experienced approximately 10 confinements. Only those polygynous and monogamous women married to men 0 to 10 years older than they had equivalent fertility.

While no relationship was found between percentage of married years polygynous and fertility, the same was not true for ordinal status or average number of wives present. An analysis of the effects of both variables revealed that while initially-monogamous first wives had fertility identical to always monogamous wives thereafter an inverse relationship obtained.

The same obtained for average number of wives present, although this variable appears not to be as important in depressing fertility.

Cross tabulation of ordinal status by average number of wives present revealed that initially-monogamous first wives in two-wife families experienced highest fertility, being somewhat higher than that of always monogamous women. Thereafter, there was an inverse relationship. The same was found for women married at ages 17 to 21.

Although it would appear that the polygyny-fertility hypothesis had been supported, if that were true, as fertility declined significant differences would have obtained in the length of birth intervals. These, however, were not generally found. Instead, parity progression ratios revealed that in all instances differential fertility resulted from cessation of childbearing at earlier parities and in greater proportions and from a narrower parity range.

Again, although it appears that age differences between spouses, particularly the advanced age of the husband which was highly correlated with ordinal status, accounted for fertility differences, equivalent age differences between monogamous and polygynous spouses did not produce similar fertility. Consequently, the only conclusion that can be drawn at this point is that if polygyny depressed coital frequency this had little or no effect on fertility and that ordinal status, average number of wives, and percentage years polygynous do not in themselves depress fertility. Rather, a yet unknown factor related to the advanced age of the husband appears to contribute to lower polygynous fertility for those with an ordinal status greater than one.

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CHAPTER 1

INTRODUCTION

Polygyny has not been nor is it currently an uncommon conjugal pattern. Anthropologists have found plural unions to have been practiced world wide by preindustrial populations. Murdock (1949:28), for example, reported that 81 per cent of his cross-cultural sample for which he had data positively sanctioned polygyny as a legitimate family form. Contemporarily, polygyny is commonly not the dominant conjugal pattern, although among some rural tribes in Ghana and the Ndai of Nigeria, for example, it is. Nevertheless, it is practiced to some extent in numerous societies throughout the world. It is not uncommon among Islamic populations, in African societies, in Malaya, as well as in others.

For a variety of reasons, anthropologists, sociologists, and demographers have been interested in polygyny as a family form and its effects on fertility levels. In recent years, there have been several studies of and periodic controversy over the effects of polygyny on fertility. One reason for this interest is that if polygyny does, in fact, affect fertility levels, it can have widespread implications for other social structures within a community or society. On the one hand, if polygyny does in fact affect fertility levels, whether through elevating them or depressing them, and if it were confined to a particular group or groups within a population, differential fertility would result. The significance of this difference would depend on the proportion of the population at risk in these groups involved and the initial size of the practicing group or groups relative to others within the society. The implications of a rapidly or slowly growing group in relationship to others within a society in maintaining or disrupting the status quo are self-evident. On the other hand, if polygyny were practiced throughout the society, it would affect the rate of natural increase.

1.1 The Polygyny-Fertility Hypothesis

It has frequently been hypothesized that polygynous unions while increasing the fertility of males depresses the fertility of females. This has been either explicitly stated or implicitly assumed in many studies of polygyny's effects on fertility levels. Those who adopt this proposition accept that there are as many as three elements inherent in polygyny which, either singly or in combination, act to depress female fertility levels.

To begin with, the frequency of sexual intercourse has, at least since Pearl's studies in the late 1930's, been thought to influence fertility. Researchers in this area frequently make the a priori assumption that, since women in polygynous marriages must share their husbands' sexual acts with a number of other wives, they will of necessity experience lower coital levels than females married to monogamous spouses. Polygyny, then, is viewed as causing a reduction in coital frequency per female thereby depressing fertility of polygynous females as compared to their monogamous counterparts. Lorimer (1958:98) supports this contention when he states that "in view of what we now know about the ovulation cycle and the chances of conception, . . . even a moderate dispersion of the husband's sexual acts would be likely to cause some reduction of the fertility of married women."

Muhsam (1956:3-4), in contrast, points out that the assumption that plural wives will receive less attention than monogamous wives is a difficult position to support. Moreover, it is not certain that if a difference in frequency of sexual intercourse between monogamous and polygynous wives did exist it would be significant enough to be reflected in observable fertility differences. However, Culwick and Culwick (1938:378-379) generally agree that beyond a certain number of wives polygyny will depress fertility but feel this would not be a general rule in families where there are only two or three wives. Olusanya (1971) concurs with this.

The second element viewed as being inherent in polygyny and contributing to decreased fertility is that of increased coital activity on the part of the male. It has been demonstrated that as the frequency of ejaculation increases, the number of active sperm decreases and may reach levels that inhibit conception. According to Dorjahn (1958:838)

> if it could be demonstrated that the coitus rate per husband per year was significantly greater for men polygynously married than for those who are monogamous, this biological factor might account for much of the observed fertility differentials.

Moreover, Dorjahn believes the assumption that the coital rate per husband per year is probably higher for polygynous as compared with monogamous males. Although this is probably valid, it cannot be substantiated. However, even if this assumption were correct, would the frequency level of intercourse be at such a level as to prevent the sperm count from rebuilding to a normal level? This assumption holds that not only are coital rates per year higher for polygynous males than for monogamous males but that coitus also occurs frequently enough to prevent spermatogenesis from raising the sperm count to a level sufficiently high to permit conception.

The third assumption made regarding polygyny is that favouritism and avoidance are essential features and are exclusive to it. The assumption being made here is that plural wives will receive less attention than wives of monogamous males. This is based on the supposition that where a man has several wives he will, on the one hand, have a favourite one who will receive a disproportionate amount of his attention and, on the other, have less favourite wives whom he will avoid more often. If, as according to Muhsam (1956:4), "polygynous husbands systematically neglect one or more of their wives, e.g. all but the favourite, the effect on the fertility of these wives will be striking." He, however, found no evidence in his study to support the contention that favouritism and avoidance either played a role or, if they did, had any affect on the fertility of various wives.

Dorjahn (1958:849) found that the Temne at least avoid the problem of favouritism and avoidance through a rotational and substitution system which enables the husband to deal more effectively with plural wives. Under the system,

> in regular turn, each wife goes to her husband for a period of 3 or 4 nights, the rotation being arranged by the head wife. Though he may wish it, the husband can neither deny a wife her turn out of displeasure nor seek an extra turn for a favourite . . . . If a woman is ill and misses her turn, it will be made up later as part of an exchange of turns with a cowife. Similarly, exchanges will be made so that there is no conflict with the menstrual cycle. Turns lost through extended visits away are not made up, though whenever possible short visits are timed so that a turn is not lost. Pregnant wives are dropped out of the rotation about three months before delivery, and suckling wives will remain out until their child has been weaned . . . .

The interaction effect of these three (coital rate of female and male and favouritism) would result in markedly lower fertility levels for females married to polygynous husbands as compared to women in the same society married to monogamous husbands.

If fertility levels are depressed by polygyny, per se, it would be found that within the same society women married to polygynous husbands would have consistently lower fertility than their monogamously married counterparts.

1.2 Findings of Previous Research

The majority of the studies testing the polygyny-fertility hypothesis have focused on African and Middle-Eastern populations. Although, as the summary of thirty-two previous studies in Table 1 indicates, the majority, twenty-one, has supported the hypothesis, the findings are inconclusive.

While Van de Walle's (1965) study of the populations of the Central Nigerian Delta, the Congo and Guinea, Henin's (1969) work on

Table 1. Summary of Findings of Selected Polygyny-Fertility Research

Polygynous Fertility Greater* or The Same		Monogamous Fertility Greater	
Source	Population	Source	Population
Baker (1950)*	Ikela (Belgian Congo)	Boelaert (1947)[1]	Nkundo-Mongo (Belgian Congo)
Busia (1954)[2]	Gold Coast	Brebant (1954)[2]	Belgian Congo
Caldwell (1968)	Ghana	Brito (1952)[2]	Menjaco, Balanta, Brame (W. Africa)
Culwick & Culwick (1938)*	Wabena (Tanganyika)	Charles & Forde (1938)	Ndai (Nigeria)
Ohadike (1968)	Lagos, Nigeria	Colle (1925)[1]	Bashi (Belgian Congo)
Olusanya (1971)	Oyo, Ifi (W. Nigeria)	Dorjahn (1958)	Temne
Pool (1968)	Ga, Adanbe, Wale, Dagarti, Grusi (Ghana)	Duren (1943)[1]	Kibali-Ituri (Belgian Congo)
Salmon (1958)*[1]	Wamuzimu (Belgian Congo)	Hemerijckx (1948)[1]	Katako, Kombe (Belgian Congo)
Schwetz (1923)[1]	Kondale (Belgian Congo)	Henin (1969)	Baggara, Kawakla, Gezera, B. N. Nomads, Merglad (Sudan)
Smith & Kunz (1976)	L.D.S. (Western U.S.A.)	Ivins (1956)	L.D.S. (Western U.S.A.)
Wilbois (1934)*[1]	Bamvele (French Cameroons)	Lindblom (1920)[1]	Akomba (Kenya)
		Muraz (1928)[1]	Sara-Madjingaye (French Equatorial Africa)

Table 1. (continued)

Polygynous Fertility Greater* or The Same		Monogamous Fertility Greater	
Source	Population	Source	Population
		Muhsam (1956)	Beduin of Negeb
		Olivier & Aujoulat (1945)[1]	Eton
		Ouedraogo (1951)[1]	Mossi (French West Africa)
		Ruppol (1947)[1]	Bofiji-Ouest (Belgian Congo)
		Thomas (1913)[1]	Ibo (Nigeria)
		Thomas (1916)[1]	Temne (Sierra Leone)
		Van De Walle (1965)	Central Nigerian Delta, Congo, & Guinea
		Vincent (1951)[1]	Kotoko
		Wilbois (1934)[1]	Besinsenga, Bamvele, Wute, Efok (French Cameroons)

Source: [1] Dorjahn (1958:840-1), [2] Muhsam (1956), the remainder as cited in the bibliography the Sudan, Muhsam's (1956) research on the Beduin of the Negeb, Dorjahn's (1958) study of the Temne, Charles & Forde's (1938) study of the Ndia of Nigeria, among many others, have found fertility to be depressed among polygynously married females, others' investigations have not supported this. Some researchers in the area have found no difference between monogamous and polygynous fertility, i.e. both Pool's (1968) and Caldwell's (1968) studies in Ghana and Olusanya's (1971) study of the Ife and Oyo of western Nigeria; while others, such as Culwick and Culwick (1938) found polygynous fertility to be higher. Still others, such as Fortes (1958) were unable to arrive at any conclusions because of the inability to control for intervening variables.

In previous research, there have been some basic problems which have impeded the determination of polygyny's influence on fertility. It has long been known that fertility is the consequence of the interaction of multiple factors. Davis and Blake (1955-56), in their classic article, outline the "intermediate variables" which affect "exposure to intercourse" and "exposure to conception" in any population. The conjugal pattern is but one of these variables. Other intervening variables, such as age of entry into unions, the proportion of women remaining permanently celibate, the amount of reproductive period spent between or after unions which have been disrupted by widowhood or divorce, the length and number of periods of abstinence from intercourse within marriage, in addition to the practice of contraception or lack thereof, are crucial in determining the levels of fertility.

These fertility-affecting variables, in addition to polygyny, have been noted by many investigators. Some have been able to control for a few of them while others have been unable to control for any. Herein lies the difficulty of determining polygyny's effect on fertility. Unless it is possible to control for the intervening variables affecting fertility, it is impossible to determine whether observed fertility differentials between monogamous and polygynous populations within the same society are the result of differences within the variables between the polygynous and monogamous populations or are, in fact, a result of polygyny and monogamy. For this reason, Dorjahn (1958:849) claims that "failure to control these variables or to make some indication of the direction and magnitude of their effect makes it difficult to interpret and/or accept much of the published material on the relation between polygyny and reproduction."

It has been suggested that some of the observed differentials are probably the result of differences between the two populations with respect to one or more of these variables. Although there are many suggested variables to be controlled, some reappear more frequently than others: age at first marriage, duration of marriage, marital instability, infertility, age differentials between husband and wife, abstinence, and continuity of marriage pattern.

1.2:1 Age at First Marriage and Duration of Marriage

Hawthorn (1970) has pointed out that age at first marriage in a population is a fundamental determinant of fertility. This would be particularly true of one characterized by natural fertility where contraception would not be a means of reducing fertility, although other practices might be. Age at first marriage, as Davis & Blake (1956:214) point out, is "one of the variables governing exposure to intercourse." Moreover, it aids in determining not only the number of fecund years spent at risk but whether those years are also the most fecund ones or not.

Relative to age at first marriage is duration of marriage. If all women in a birth cohort survive to menopause and all marry at the same age, they would be at risk for the same period of time. However, if, for example, one-half married five years later than the first, this half would be at risk for less time and should, all things being equal, have a lower fertility rate. Moreover, women who marry later are not only spending fewer years at risk but those years spent at risk may be less fecund ones. In addition, even where women's marriages are of the same duration, the age at which they enter those marriages determines the fecundability (monthly chance of conception) of those years. For example, women married for fifteen years and married at age 18 are going to have a higher quality of fecundability than women also married for fifteen years but not married until age 30. As Davis & Blake further point out, "if . . . the age of entry into unions is late, the potential fertility that is lost can never be recovered" (215).

Some investigators have suggested that differences exist between women married to polygynous males and those married to monogamous males in terms of age of entry into first unions and duration of those unions and that it is these differences which account for the differential fertility between the two groups. Ohadike (1968), Fortes (1958), and Henin (1969) claim that those entering polygynous marriages may be older than those initiating monogamous marriages. Fortes (1958) found among the Ashanti that as women grow older they tend to enter more marriages and to be more commonly married to polygynists. Muhsam (1956) found second wives among the Beduin of the Negeb to be older. He also found that polygynous wives in this population in general had marriages of shorter duration than their monogamous counterparts. Romaniuk (1968), conversely, believes that polygyny facilitates early marriage. Supportive of this contention is Dorjahn's (1958) finding among the Temne that monogamous women tended to marry later than women in polygynous unions.

Despite the importance of controlling for these two variables, most researchers either have neglected to do so or have been unable to do so. The importance of controlling for both age of entry into first unions and duration of marriage is illustrated by Olusanya's (1971) study of five rural communities in western Nigeria. He discovered initially that when a count was made of the number of children born to polygynously and monogamously married females, polygynists, on the whole, were more fertile. When the effects of age at marriage and duration of marriage were controlled for, however, there was virtually no difference in fertility between the two groups.

In conjunction with age and duration of marriage is completed fertility. In the majority of these studies, women of all ages are included rather than only women who have completed childbearing. The assumption being made is that monogamous and polygynous women, as well as women of different birth cohorts within each group, share the same childbearing patterns. This may or may not be the case. However, by using only women who have completed fertility, this perhaps erroneous assumption would be avoided.

1.2:2 Marital Instability and Infertility

Another variable affecting fertility, and related to duration of marriage, is marital instability. One of the Davis-Blake variables is "amount of reproductive period spent after or between unions." They state:

> Any negative effect on fertility from variable [time between unstable unions] is a function of both the rate of dissolution of unions and the time lost between them. If unions are stable, or if they are unstable but no time is lost between them, fertility will not be affected adversely (1955-56:226).

Marital instability may, then, result in time lost at risk either between unions or after unions, thereby lowering fertility.

As was demonstrated by Lauriat (1969:492), marital dissolution tends to reduce fertility, at least for her sample. She found that women in discontinuous unions could be said to have lost 21 per cent of the fertility they would have had had they remained continuously married.

Charles and Forde (1938:159) found that the problem in determining polygynous and monogamous fertility rates among the Ndai was complicated by the great frequency of divorce and remarriage.

Many researchers in this area believe that marital dissolution is naturally more frequent among polygynous than among monogamous unions. Olusanya (1970:153) states that "polygynous households possess the seeds of instability by their very nature." He claims that a man with more than one wife may be unable to give each the attention expected and that favouritism may lead to squabblings and eventually to divorce. He found marital instability to be linked with an absence of a strict legal bond (customary marriage) and polygyny.

Dorjahn's Temne informants indicated that polygynously married males were more likely to have marital difficulties, and his Mayoso data indicate that a greater percentage of those divorcing females were in polygynous households. He also cites several writers, Hemiryckx, Boelart, and Sokier, who also found polygyny and divorce to be highly related. Henin (1969), as well, found divorce to be greater among the polygynists in his sample.

Not only does polygyny seem to tend to encourage divorce but there are a greater proportion of women who have experienced discontinuous unions, either because of divorce or death of a spouse, found in polygynous households. Romaniuk claims that polygyny facilitates the remarriage of widows and divorced women. It is well known that in many populations, particularly where no sex-ratio imbalance exists and where women outlive males, widows are a source of polygynous wives. Moreover, in societies where the levirate is practiced, a man marrying his deceased brother's wife may result in polygyny.

Olusanya (1970:153) found marked differences in the percentage of first marriages and remarriages for polygynous and monogamous women among the Yoruba of western Nigeria. A higher percentage of monogamous women in his sample were married for the first time and a higher percentage of polygynous women were remarried. He attributes the higher percentage of remarried females among polygynous households to the difficulty of these women in finding bachelors for husbands due to the bride price.

It is claimed by several that divorced women, due to their status, per se, are less fertile than continuously married females. Dorjahn (1958) claims that not only is the mean duration of marriage less for them but they also experience a lowered coital frequency prior to divorce. Caldwell (1968), however, did not find that successive unstable marriages had significantly lowered female fertility in his Ghanian sample. Even so, most researchers fail to control for discontinuous unions. Henin (1969) examined fertility in continuous unions only but failed to control for age of marriage and proportion childless.

A number of studies have indicated that there is a higher proportion of subfecund and infertile women in polygynous households. Muhsam's (1956) study of the Beduin of the Negeb found a higher percentage of infertile women within polygynous households and indicates that infertility of the first wife may encourage a man to marry again. In fact, he found that infertility was high among both polygynous first and second wives. Henin (1969) also believes that infertility of the first wife may lead to polygyny.

Romaniuk (1968) and Van de Walle (1965) believe that a selective factor may make the proportion of subfecund and sterile women higher in polygynous households. Subfecund mothers, for example, may be taken into polygynous households by men desirous of increasing their progeny. Although the fertility of these individual women may be low, it increases the total fertility of the male. According to Van de Walle (1965:308), "it is difficult to disentangle the influence of marital status on fertility from the influence of fertility on marital status." Does infertility lead a husband to divorce a wife who then enters a polygynous marriage; does infertility of the first wife lead the husband to marry a polygynous second wife; or do infertile and subfecund women enter polygynous unions.

Muhsam (1956:9) brings up an additional factor with regard to the higher incidence of infertility among polygynous households, that of reporting bias. He indicates that, due to the importance in these societies of male virility, sterility among monogamous households may be underreported since monogamous males in childless households are more apt to report fictitious children than are polygynous males with infertile wives.

Infertility seems to be widespread in tropical Africa, for example, and has been attributed to high conjugal mobility resulting from divorce, which is higher among polygynous unions. According to Olusanya (1971:174), high conjugal mobility results in reduced exposure to intercourse and reduced fertility through the spreading of venereal disease. Dorjahn (1958:151) also attributes the higher rates of infertility among polygynous households to venereal disease. Although there are no medical studies to substantiate his contention, Dorjahn claims that in larger households wives are more likely to have extra-marital relations, thereby increasing their probability of contracting venereal disease. The husband and other wives also, according to Dorjahn, become diseased, thus lowering the fertility of the polygynous segment. Romaniuk (1968), however, claims that even if polygyny plays a more active role in dissemination of venereal disease it is not sufficient to make polygyny an imminent factor in infertility.

Whether the higher incidence of infertility in polygynous unions is a result of a selection factor or venereal disease, when determining the fertility levels of polygynous and monogamous females, there needs to be control for the effects of infertility. By including all wives, the fertility of polygynous wives is going to appear to be depressed relative to monogamous wives since there is a higher incidence of infertility among them. The importance of controlling for infertile females when calculating fertility rates is indicated by Romaniuk (1968) who, when controlling for this factor, found the differences in fertility between the two types considerably reduced.

1.2:3 Abstinence

The majority of studies in this area have been conducted in African societies in which are frequently found customs and traditions which act to depress fertility. Olusanya (1971:172, 174) observed two such practices among the Yoruba which have such an effect. The first is that Yoruba women cease childbearing once their daughters begin. It is conceivable, therefore, that they may discontinue bearing children long before the onset of menopause. The second practice is that a wife refrains from sexual intercourse for some three to four years after conception. Dorjahn (1958:855) also found intercourse forbidden among the Temne for from two to three months before the birth of a child until from one-and-a-half to two years afterwards.

It could be assumed that such practices would affect the fertility of monogamous and polygynous women equally. Olusanya (1971), Dorjahn (1958), and Lorimer (1958), however, point out that coital-restricting customs, such as the lactation taboo, are more likely to be closely observed in polygynous rather than monogamous households. The argument made here is that where a man has several wives he is more apt to observe the proscription against intercourse with one or two of them who are observing a two-to-three-year period of abstinence after childbirth than is a man with only one wife. Dorjahn, citing Krzywicki, claims that in monogamous populations husbands resume sexual relations with their wives soon after confinement. Lorimer (1958) states that at times when lactation taboos are in force, some African societies permit extra-marital sexual relations for monogamous husbands while in others there is a cultural provision for some sort of incomplete intercourse. These provisions are not universal, however.

Furthermore, Olusanya (1971) claims that polygynists may be less well educated and more traditional than monogamists and would, therefore, be more apt to observe a lactation taboo. Caldwell's (1958:177-8) findings support this contention. He did, in fact, find in his study of Ghana that education levels of both polygynist males and females were lower than for monogamists. He found that

> amongst female respondents, only 5 percent of those with secondary or university education were found in polygynous marriages as compared with 15 percent of those with lesser education. . . . Similar margins were found amongst the males. Only 4 percent of those with secondary or university education were found to be polygynously married, as in fact was a similar proportion with middle school education, but below this educational level the proportion of polygynists climbed to 11 percent. . . .

Caldwell furthermore states that "social traditionalists are marked less by age than by their greater adherence to polygyny. . ." (149). He also observed that "male polygynists are much more likely to be traditionalist in outlook and opposed to innovation than are their wives, some of whom may well be participating in polygynous marriage without feeling the slightest approval of the institution" (135). Little difference in attitude toward family planning was discovered between monogamous and polygynous females. Polygynous males, on the other hand, expressed stronger resistance to the practice of contraception than monogamous males. Moreover, husbands' views are a more important determinant of whether such practices are adopted. One would suspect, therefore, that if polygynous males are more resistant to change than monogamous males, in the area of contraception, they will be more consistent in observing customs and traditions than will the latter.

There is some support, then, for the belief that if the lactation taboo, as well as other coital-restricting taboos, has any influence in depressing fertility the effects are likely to be more pronounced in polygynous unions. However, as Olusanya (1971:173) points out, where polygyny and lactation taboos exist, it is difficult to determine if there is any observed differential which is the cause and which is the effect, i.e. whether polygyny led to observance of the lactation taboo or whether the lactation taboo led to polygyny.

1.2:4 Age Differentials

As Caldwell (1963-64) and others have pointed out, in a society without a sex-ratio imbalance, polygyny is facilitated by men marrying women who are considerably younger than themselves.

Dorjahn (1958:855) believes that this age differential will depress the fertility of the younger wives. He claims that in this situation a woman's most fertile years are spent as a member of a large polygynous household married to a man of relatively advanced years. Even if she married a younger man after the death of this husband, her most fecund years would be behind her. The age differential would then, according to this view, act to reduce polygynous fertility relative to monogamous rates.

However, it is possible that just the opposite results will obtain. Caldwell (1968:84, 93) found that discussion about desired family size is related to family structure. He found that such discussions are more difficult in polygynous than monogamous households, probably because the kind of cooperation and mutual understanding necessary to successful limitation is more difficult to achieve in these types of marriages. The age gap between spouses which is perhaps greater among polygynists probably mitigates against open discussion. Consequently, in a society in which family planning has been or is being introduced, the age differential in polygynous unions, coupled with other factors, may act to maintain a higher level of fertility than in monogamous unions.

1.2:5 Continuity of Status

Another factor complicating the assessment of polygyny's effect on fertility is the continuity of the wife's marital status. Without exception, studies in this area consider only the wife's current status. As Fortes (1958), Olusanya (1971), Muhsam (1956), and Pool (1968) have indicated, a wife's earlier status may be different from her current one and be relevant in determining her fertility level.

First wives in polygynous unions most frequently begin married life in monogamous unions. Olusanya (1971:174-5) points out that in African societies virtually all marriages begin by being monogamous. A variable of time elapses before a polygynous wife is introduced into the household. In some instances, as a result, a currently polygynous wife may have spent the majority, if not the total, of her fecund years at risk in a monogamous union. Olusanya criticizes the Culwicks who claim to have studied always polygynously and always monogamously married females. He claims that it would be relatively easy to find a significant number of always monogamous females but questions whether, under the circumstances of how polygynous marriages are likely to arise, any number of always polygynous females could be found.

To further complicate analysis, some women may be subjected to alternating periods of monogamy and polygyny. That is, a woman may be initially monogamous, then become a polygynous wife when her husband marries again, and then resume her monogamous status with the divorce or death of the polygynous wife. In other situations, a woman may be initially monogamous and than, as a result of divorce from or death of her first husband, enter a polygynous union. It is also possible that later the polygynous wife (or wives) may become divorced or deceased and the wife under consideration will again resume a monogamous status. In other situations, it is conceivable that a polygynous wife, upon the death of or divorce from her husband, will marry into a monogamous union with a second husband, who again may or may not become a polygynist.

If polygyny does in fact affect fertility, a woman can be alternatively subject to polygynous and monogamous fertility. Olusanya (1971:175) asks "how does a population analyst separate the first influence from the second so as to have a meaningful comparison with women who have always been monogamous [or always polygynous, for that matter]?" Fortes (1958:308), moreover, claims that

> the question raised as to whether monogamously married women are more or less fertile than the wives of polygynists is therefore obviously unanswerable for a community like Agozo, especially in view of the fact that women continue to bear children all through the child-bearing years.

Muhsam (1956:9-10) indicates still another problem in analyzing polygyny's effects and that is the fact that the number of wives frequently varies with time. It would be unusual, particularly in large families, for the number of wives to be constant. As a man adds wives, there may be, at earlier stages, only two, then three, and later four or more. Moreover, a polygynous wife may periodically die or divorce the husband. If, as has been stated by the Culwicks (1938), the number of wives will have an effect on fertility, this becomes a difficult situation to take into account during analysis.

1.3 Adequacy of Data

One of the basic problems, if not the basic problem in controlling for intervening variables, is the lack of accurate and complete demographic data regarding the sample. The majority of the studies have been conducted in African societies where the problems of demographic data collection have been well documented. Unfortuntely, the problems encountered seem not to have diminished significantly over the past thirty-five or forty years as witnessed by the similarity in limitations encountered by various researchers in the area over the years.

To begin with, as Dorjahn (1959:91) indicates, censuses of various African territories do not consist of enumerations and particulars on each individual. In most cases they are no more than estimates or "counts" of villages or clans. Census surveys are a relatively recent innovation in Africa. Moreover, vital statistics are either lacking or inadequate. Van de Walle (1965:306) notes for example, that birth registration, if it exists, is of recent introduction and of incomplete coverage.

This lack of complete and accurate vital statistics means there is no readily available reliable data base from which to generate variables which can be controlled in an attempt to determine the effects of family structure on fertility. As a result of this, researchers are basically dependent on interviews. Here again, both Dorjahn (1959) and Olusanya (1971) indicate an additional problem is introduced by the shortage of trained personnel.

Aside from problems in the mechanics of data collection, investigators in Africa generally confront a problem of high illiteracy levels, as noted by Dorjahn (1959), Olusanya (1971), and Van de Walle (1965). Illiterate informants have little or no interest in numbers and are unable to give retrospective information. This means it is often impossible to obtain essential information of the type necessary. For example, researchers over the years have noted the difficulty or impossibility of obtaining from informants the current ages of both spouses, the age at marriage of either or both spouses, the duration of the marriage unless relatively short, the present ages of surviving children, the ages at which deceased children died, information about stillbirths, the birth order much less the birth dates of children, or even the total number of children ever born. Van de Walle (1965:306) indicates that in countries where legislation prohibits child marriage and sets a minimum age of 14 or 15 years for females, purposeful misreporting of ages of married persons may also occur. As a result, much information is either omitted or is based on the surmise of the interviewer.

Nevertheless, without certain vital information it is impossible to control for the necessary intermediate variables and, as Olusanya (1971:167) has pointed out, "a good deal of the data on polygyny is insufficient for a quantitative measurement of the effect of polygyny on fertility." As a result of inadequate and inaccurate quantitative demographic data, the empirical evidence to date is ambiguous.

1.4 Studies of L.D.S. (Mormon) Polygynous Fertility

There is one group which practiced polygyny for whom extensive demographic data are available. This is the L.D.S. (Mormon) population living in the western United States who observed the practice from somewhere in the early 1830's or 1840's until 1904.

Several studies of contemporary Mormon fertility have been undertaken by Hastings et al. (1972), Pitcher et al. (1974), Spicer & Gustavus (1974), and Wise & Condie (1975), among others. There have been, however, but two studies of nineteenth-century Mormon fertility which considered polygyny, or polygamy as the Mormons refer to it.

The first of these was by Ivins (1955-56) and the second by Smith and Kunz (1976).

Ivins' report is essentially a descriptive historical report of polygyny, rather than a demographic study, in which demographic data is included for illustrative purposes. The source of Ivins' data is unclear, although it most probably is derived from Esshom's (1913) work, *Pioneers and Prominent Men of Utah*. Regardless, using a child-woman ratio, Ivins determined that monogamous women bore, on the average, 8 children while their polygynous counterparts bore an average of 5.9 children. In this study, Ivins controlled for no variables. Therefore, all married women regardless of age at marriage, duration of marriage, and infertility were included in his polygynous category. The same, of course, is true for monogamous women. However, the probabilities that older and more infertile Mormon women were married in polygynous unions than monogamous are much greater.

For their study of Mormon polygynous fertility, Smith and Kunz (1976) drew their sample from Esshom's work. The sample was selected to include couples with completed fertility and families with up to three wives only.

Their initial analysis, excluding second wives of monogamous males, revealed that monogamous fertility was 7.82 while polygynous fertility was 7.46. However, fertility differentials were found to exist between wives in polygynous unions based on their ordinal position. It was discovered that

> as a consequence of these differentials there is both an increasing and diminishing return in terms of fertility as a man takes additional wives. The man with two wives has more than double the fertility of his monogamist counterpart, but the addition of a third wife only increases male fertility by a further 25 per cent rather than the expected 50 per cent (471).

In controlling for childlessness, it was found that while infertility affects the fertility levels of certain kinds of wives, controlling for it does not affect the overall pattern of fertility. They discovered, moreover, that controlling for infertility does not change the ranking of wives in terms of completed marital fertility. While Muhsam (1956) and Momeni (1975) suggest that one reason for a man's entering polygynous unions is the infertility of the first wife, Smith & Kunz found that not only did polygynous first wives in two-wife families have less childlessness but also the highest fertility at 10.9 children. However, in three-wife families, first-wife infertility was highest.

When controlling for child-spacing, it was found that differential child-spacing along could not account for observed adjusted fertility differentials. It was discovered, for example, that "first birth intervals are markedly similar for first wives in all families. Second wives show a longer interval between marriage and first birth and third wives have a still longer first birth interval" (473). They also discovered that "for all births after the first, the birth intervals of wives of polygynists are shorter than those of monogamists and the difference is statistically significant" (475).

Although Smith & Kunz standardized for duration of the fecund period, they did not control for age at marriage, since they assumed that "a reduction in fecundity due to age is . . . negligible within the age range in which most marriages occur" (477). However, even after controlling for duration of marriage and occupation, Smith & Kunz found that the overall pattern of fertility was not changed. They found that, even after standardizing, first wives in polygynous unions had the highest fertility followed by first monogamous wives.

Smith and Kunz' data essentially eliminate the problems inherent in the data of previous studies attempting to determine polygyny's effect on fertility on Middle-Eastern and African populations. However, they fail to address themselves to other significant problems suggested by these studies. The current study, examining the same population but using a different data base, will address itself to answering some of those relevant questions which have arisen as a result of previous work discussed earlier.

CHAPTER 2

THE POPULATION

The practice of polygyny among a North American population of basically western-European descent was unique to the members of The Church of Jesus Christ of Latter-day Saints (the Mormons).

2.1 A Brief History of Mormon Polygyny

2.1:1 The Initiation of Polygyny

Just when the practice of polygynous marriage was introduced among the Mormons is uncertain. According to N. Anderson (1942:38) and K. Young (1954:90, 92), it was possibly discussed, if not practiced, prior to the Mormon emigration from New York in 1831. Moreover, Orson Pratt is said to have reported that the "Principle," as the practice was commonly referred to, was made known to Joseph Smith as early as that year; and both George A. Smith and Parley P. Pratt are said to have claimed that Smith discussed it with them in 1839 and 1840 respectively. Ivins (1955-56:229) and N. Anderson (1942:38) report that Joseph Smith took the first plural wife on April 5, 1841, and O'Dea (1964:74) claims that plural marriage was "being practiced in secret among the top circles of the church" as early as 1842.

Regardless of when the idea of polygynous marriage was actually conceived or the first polygynous marriage was entered into, Joseph Smith is purported not to have received the revelation regarding plural marriage, recorded in detail in *The Doctrine and Covenants*, Section 132, until July 12, 1843, in Nauvoo, Illinois. However, it was not until ten years later, on August 28, 1852, at a conference in Salt Lake City, Utah, that the "Principle" was announced to the general membership of the church and was publicized in a special edition of the *Deseret News*, the church newspaper, on September 14. In spite of this, it is known that polygyny was practiced in Nauvoo. Several historians claim that it was one of the sources of conflict between the Mormons and their gentile (non-Mormon) neighbours which eventually resulted in the assassination of Smith and the emigration of the Mormons from Nauvoo to the Rocky Mountain region.

Moreover, after settling in the Valley of the Great Salt Lake in July, 1847, and prior to the announcement of August, 1852, plural marriage was practiced openly in Utah and surrounding areas, although it was not openly admitted and there apparently was still an attempt to deny its existence outside the region. According to reports from European converts (cf. Mrs. Stenhouse [1865]), rumors of the practice reached Europe prior to 1852 but were denied in the official Mormon newsletter (*Millennial Star*, published in Liverpool) as well as by missionaries serving in Europe although they themselves were frequently practitioners (O'Dea, 1964:104).

2.1:2 Mormon-Federal Government Conflict

Although plural marriage was practiced in the relative isolation of the State of Deseret (which encompassed all of present-day Utah and Nevada, parts of Idaho, Wyoming, New Mexico, and Colorado, over two-thirds of Arizona, and a large part of California including the

San Bernardino Valley and the Port of San Diego) and later the Utah Territory and Mormon communities in the previous State of Deseret, it was not long before it aroused indignations in the East. This resulted in a prolonged controversy and attempts at censure by the United States government.

Conflict between the Mormon Church and federal officials began to brew as early as the 1850's. As a consequence of the attention called to the practice of polygyny and the resultant clamour for federal action, Representative J. S. Morrill introduced a bill in February, 1860, to punish and prevent the practice of polygamy in the territories of the United States. The bill passed the House but died in committee in the Senate. It was, however, passed upon reintroduction in April, 1862, and was eventually signed into law by President Lincoln (K. Young, 1954:336). However, in Utah the law was unenforceable as no grand jury would indict a man for this offense.

The outbreak of the Civil War succeeded in diverting attention for a short while from the problem of polygyny. After the war, however, the greater immigration into Utah and surrounding regions of gentiles (non-Mormons) resulting from the completion of the transcontinental railroad in 1868 and the development of mining in the area led to renewed attacks on the institution.

As an outcome of these renewed attacks and in an effort to strengthen the Morrill Act, the Cullom Bill, a strong anti-polygamy measure, was passed in 1869. It succeeded basically only in defining polygamy in Utah as a serious problem to be dealt with on the national level. This, however, was just the beginning of a series of laws to be passed during the next two decades aimed at eliminating plural marriages among the Mormons.

From 1870 to 1890 there was an intensification of conflict between the Mormons and the gentile population. Although the crux of the problem was essentially a struggle for political and economic control of the Territory, polygamy became the cause celebre.

Since the Morrill Act of 1862 was thought to be and was essentially ineffectual in eliminating plural marriage, the Poland Bill was passed in the summer of 1874. The bill gave additional strength to the enforcement of anti-polygamy laws by removing control of the courts from the Mormon Church (K. Young, 1954:351). In 1874, George Reynolds was the first to be convicted of bigamy. The Territorial Supreme Court set aside the conviction in the spring of the following year on the basis of a technicality; but he was again found guilty in December and was sentenced to two years' imprisonment and a $500 fine. The case was appealed to the United States Supreme Court on the basis of infringement on the right to freedom of religion as guaranteed by the Constitution. However, in January, 1879, the court upheld the conviction and the constitutionality of the Morrill Law. According to O'Dea (1964: 108), the case was important as it set the precedent for convictions that were to follow.

Even with the conviction of Reynolds, feelings against polygyny continued to run high throughout the country. In 1880, President Hayes declared that "it was a duty 'to suppress polygamy,' and in 1881 President Arthur called plural marriage an 'odious crime'" (O'Dea, 1964: 110).

In 1881 Senator George Edmunds introduced an amendment to the anti-polygamy bill of 1862. The Edmunds Law, passed in March, 1882, made cohabitation with plural wives, as well as entering into plural marriage, a crime punishable by a fine of $300 and/or six months in jail. The vigorous enforcement of this law drove church leaders as well as members into exile and resulted in the imprisonment of hundreds of others. The conviction of Rudger Clawson in 1884 under this act signaled the intensification of the final struggle between the federal government and the L.D.S. Church.

Still not satisfied with the strength and effectiveness of the legislation, Edmunds introduced the "Utah Bill" in 1884 which, had it passed, would have established martial law in Utah, disfranchised all Mormons, confiscated all church properties, and strengthened the negative sanctions against those convicted of illegal cohabitation. Two years later, the bill was reintroduced as the Edmunds-Tucker Act, passed both houses, and became law on March, 1887, without the signature of the President (K. Young, 1954:353-54).

The passage of anti-polygamy legislation held drastic consequences for polygynous families as well as for the church, particularly after the passage of the Edmunds Act but more so after the enactment of the Edmunds-Tucker Law.

Polygynous families, especially throughout Utah, Idaho, Arizona, and New Mexico, reacted in various ways in an attempt to avoid arrest, prosecution, and possible imprisonment of the husband. Some males were sent on missions outside the territory, frequently to Europe, others went into hiding, including the President of the church, and many were aided in escaping to Mormon settlements in either Canada (Cardston) or Mexico (Colonia Juarez) via the Mormon underground railroad, often accompanied or later joined by their families. At times plural wives were secreted in out-of-the-way places and were moved frequently from place to place throughout the territory. Others returned to their parents assuming the rôle of single women. Various schemes were employed to hide the identity or the whereabouts of polygynous males and females from federal officers. Nevertheless, during 1887 there were almost 200 Mormons in jail in Utah, a considerable number of others who had already served at least one prison term of from six months to five years, and many more who were in hiding (O'Dea, 1964:110; Gems, 1970:484).

As a result of relentless efforts on the part of the federal officials, particularly after the passage of the Edmunds-Tucker Act, the L.D.S. Church was on the brink of financial ruin by 1890. This, coupled with the separation of hundreds of families and the desire for statehood, led Wilford Woodruff, then President of the church, to issue the Manifesto on September 24, 1890, abolishing the principle of plural marriage which had been practiced by the Mormons for approximately fifty years.

2.1:3 The Post-Manifesto Period

After the Manifesto, polygynous families were faced with the problem of handling their domestic affairs, and the solutions were many and varied. Some men solved the problem by divorcing or deserting plural wives, others divorced the older "legal" wife and married the younger polygynist wife with young children, others simply ceased living with polygynous wives while continuing economic support, while others carried on as before. The latter situation often meant that plural wives remained in hiding for several years as prosecutions for polygamy and illegal cohabitation continued through the 1890's. However, some men lived openly in polygamy with their plural wives in the same household, and others continued to take additonal wives after 1890.

This practice of marrying polygynous spouses which continued after 1890 had the tacit and at times overt approval of some members of the church hierarchy, some of whom performed the temple marriage ceremonies and took additional wives themselves. As a consequence, and due to enduring federal pressure, Joseph F. Smith, by then President of the church, issued the second Manifesto in April, 1904, a reaffirmation of the first. Not only did it prohibit the taking of plural wives but promised also the excommunication of both those who entered further polygynous unions and those who solemnized such.

In spite of the second manifesto, there were those church members who believed that since polygamy had been divinely inspired the federal government lacked the authority to repeal it. Consequently, a schism formed within the church membership resulting in the formation of a splinter group, the Fundamentalists. Although the Mormon Church today forbids plural marriage among its membership, this group currently maintains the practice in Utah and contiguous areas.

2.2 Ideological Beliefs Supporting Polygyny and High Fertility

As De Jong (1965) and others have discovered, religious beliefs, and particularly fundamentalist beliefs, frequently play a major role in affecting fertility levels of various populations.

Although Mormonism is not fundamentalist in the same nature as other North American religions, i.e., it does not always accept a literal interpretation of the Bible, it does possess elements of basic fundamentalism, notably those which support high fertility. According to De Jong (1965:542), those who hold fundamentalist religious beliefs are "likely to act on the assumption that life proceeds according to the will of God, the attempt to regulate conception interferes with God's plan; and this is viewed with condemnation as a secular trend." This position has been and is currently accepted by Mormons, although the theological basis for this is significantly different from other Christian sects. Moreover, Mormons exhibit another fundamentalist tenet in their acceptance of the literal interpretation of the biblical commandment to "be fruitful and multiply, replenish the earth, and subdue it" (Genesis, 1:28).

Perhaps more importantly than traditional fundamentalist beliefs is the impact of a unique Mormon theology on Mormon marriage and childbearing practices. To begin with, while some other ideologies proclaim celibacy to be the ideal temporal state, Mormon belief holds that not only is marriage the most desirable state but one also ordained by God. *The Doctrine and Covenants* (49:15), a compilation primarily of revelations received by Joseph Smith, states that "verily I say unto you, that whoso forbiddeth to marry is not ordained of God, for marriage is ordained of God unto man." A state of singleness is, therefore, not only viewed as undesirable but unacceptable as well.

There are, however, more important aspects of the Mormon belief system which distinguish it from other Christian sects and which have more significant influence on marriage and childbearing.

Briefly, Mormon theology presupposes a teleological progression of man through three stages: pre-existence, temporal existence, and post-mortal existence.

Mormon belief holds that prior to becoming mortal man resided in a pre-existence with God who, too, at some prior time was a temporal being. In this pre-existence countless spirits, who are the progeny of God, reside awaiting temporal bodies so that they may begin their progression to the ultimate glory which God has attained. (Mormons interpret the concept "God, the Father," in a literal context. The Mormon belief in pre-existent creation is reflected in a hymn by Eliza Snow, "Oh, My Father," in which she refers to the spiritual or pre-existent mother.)

This need for spirits to become mortal and to be given the maximum opportunity on earth to strive for salvation in the hereafter is one of the motivations among Mormons for maintaining high fertility.

This, too, was one of the justifications for plural marriage and was, and is, seen as a high purpose, if not the main one, of life's work on earth (cf. *The Doctrine and Covenants*, 132). An expression of the importance of this belief and its implications for Mormon fertility is Brigham Young's statement in 1856 that

> there are multitudes of pure and holy spirits waiting to take tabernacles, now what is our duty? To prepare tabernacles for them; to take a course that will not tend to drive these spirits into families of the wicked, where they will be trained in wickedness, debauchery, and every species of crime. It is the duty of every righteous man and woman to prepare tabernacles for all the spirits they can (p. 56).

This belief in pre-existence and the need to bring as many spirits into the temporal world as possible is one of the beliefs which has led to an exhortation against birth control. The L.D.S. Church has never had a formal policy regarding contraception as has the Catholic Church. However, the Mormon ecclesiastical hierarchy has traditionally and consistently inveighed against family limitation in its writings and speeches from the pulpit. (Refer to Hastings, et al. [1972] for a summarization of the historical continuity and modifications of the proscriptions against contraception and family limitation.)

One's temporal life is seen as the second step in the progression to holy exaltation. The temporal existence is, in essence, a "testing ground." One gains salvation on this earth by his own labours, by following the commandments of God, as interpreted by the L.D.S. Church, and through the attainment of knowledge. Active effort and obedience to the laws of God, combined with knowledge, will lead men to perfection, which, in Mormon belief, is equated with Godhood.

Mormon belief in an eternal afterlife means, for those who reach the most exalted state, a promise of becoming a God much like the one who created this universe. A Mormon aphorism derived from Joseph Smith's "King Follet Discourse" (1844) states, "as Man is, God once was; as God is, Man may become." In this most exalted state men are endowed with creative and reproductive powers just as they were in their temporal state and as their God, who created them, was in their pre-existent state. In their post-mortal existence men may become Gods and create new worlds and populate them with spirit children, thus providing them with the opportunity to enter eternal progression. Mormons, then, are polytheistic.

In order for a man to reach his highest degree of glory, however, he must be married in a Mormon temple and be "sealed" to his wife for "time and all eternity." Without this "sealing," the marriage would not be valid after death. Not only are husband and wife sealed to each other, but so also are parents and children. Sealing is perceived as an essential act as it guarantees that children and parents will be together in the afterlife.

Moreover, temple marriage is believed to be imperative for the highest form of salvation. Mormons believe that those who do not benefit from this ceremony become angels in heaven and do not receive the full degree of glory regardless of accomplishments during their mortal existence. *The Doctrine and Covenants* (132:16-17) states that these angels

> are ministering servants, to minister for those who are worthy of a far more, and an exceeding and an eternal weight of glory.
>
> For these angels did not abide my law; therefore, they cannot be enlarged, but remain separately and singly, without exaltation, in their saved condition, to all eternity; and from henceforth are not Gods, but are angels of God forever and ever.

Those never married or never married in a Mormon temple during their temporal lives are thus denied ultimate glory in the afterlife.

During the early days of the church, the doctrine of progression was closely integrated with polygyny. *The Doctrine and Covenants* (132:63), addressing itself to the issue of plural wives, states:

> for they are given unto him to multiply and replenish the earth, according to my commandment, and to fulfil the promise which was given by my Father before the foundation of the world, and for their exaltation in the eternal worlds, that they may bear the souls of men; for herein is the work of my Father continued, that he may be glorified.

Moreover, progress to Godhood was commonly believed to be related to numerous progeny. Those with a plurality of wives were believed to gain the highest exaltation. This led to a common practice of marrying by proxy plural wives from unmarried women in the church who had died and having them sealed to the living husband. It was believed that not only would these women be wives to the husband throughout eternity and participate in the procreation of new worlds but they would also be saved from an eternity of servitude.

Theological beliefs have meant that the importance of the Mormon family is indeed genuine since one's highest salvation is dependent on temple marriage and the bearing of children. According to O'Dea (1964: 60), the

> Mormon doctrine of marriage made of sexuality a means of celestial glory. The tendency to consider the activities of the world the chief concern of religion had issued in giving sexual relations and procreation the central role in man's progress to divinity.

Under this doctrinal system, then, the more wives and children a man possessed the higher was his status not only on earth but also in heaven. Women also held this belief. K. Young (1954:141), in writing on the polygynous period in church history, states that "a woman's great glory in those days was her ability to bear many children. One who could not was bound to end up in a lesser social sphere both here and in the hereafter." Consequently, the Mormon wife's primary role was that of childbearer; and motherhood was elevated to a height perhaps previously unknown in other Christian religions. It is doubtful that the role of motherhood has been sanctified elsewhere to the extent it has in Mormonism.

Because of these religious beliefs, both men and women were exhorted from the pulpit and subjected to both formal and informal pressures outside the wardhouse to fulfill their moral obligations of marrying and bearing children. Brigham Young, in 1861, admonished Mormon women in a sermon that it was their duty to bear children.

> Sisters, do you wish to make yourselves happy? Then what is your duty? It is for you to bear children, in the name of the Lord, that are full of faith and the power of God--to receive, conceive, bear, and bring

> forth in the name of Israel's God, that you may have the honor of being the mothers of great and good men (K. Young, 1954:174).

The high purpose of polygyny was defined by Heber C. Kimball, who had forty-five wives to his credit, when he encouraged men to take additional wives and bear many children. He said:

> suffice it to say I have a good many wives and lots of young mustards that are growing. . . . The Lord told me to get them. 'What for?' To raise up young Mormons, not to have women to commit whoredoms with, to gratify the lusts of the flesh, but to raise up children (K. Young, 1954:176).

As a result of a peculiar Mormon theology and a social organization that maximized social control and conformity, marriage of all, polygyny, and large families were encouraged and highly valued in nineteenth-century Mormondom.

2.3 Additional Characteristics of Mormon Polygyny

2.3:1 Proportion of The Population Polygynous

Although there was general official encouragement to enter plural marriage, the Mormon society remained basically monogamous. As no official records were kept of those who entered polygyny, it is not certain and is difficult, if not impossible, to determine just what proportion of the Mormon population ever practiced polygyny at any given time. Even census records are not reliable. K. Young (1954:124), for example, found in examining census records for Washington County, Utah, where the proportion of polygynous marriages was high, that women known to be plural wives were often reported as being single in the census tabulations. As a result, there are but varying estimates of the proportion of the population involved in the practice ranging from a low of 2 per cent to a high of 50 per cent.

The L.D.S. Church at one time estimated plural marriages among its membership at between 10 and 15 per cent (O'Dea, 1964:246). The Utah Commission reported on November 18, 1884, that approximately 75 per cent of males and females had never entered polygamy (Gems, 1970: 347). However, if Esshom's collection of genealogies is representative, it would appear that approximately 28 per cent of males had been married in polygynous unions (Smith & Kunz, 1976:466). Moreover, Ivins (1955-56:230), after examining all sources available, claims that there may have been a time when polygynous marriages accounted for as many as 15 or 20 per cent of Mormon families in Utah. Smith & Kunz (1976:471) arrive at an estimate of 8.8 per cent incidence of polygynous marriages.

Even though the exact numbers or proportions practicing this form of marriage at any one time are unknown, it is known that there were various periods in which there occurred an upsurge in the numbers of polygynous marriages performed.

The first such period of noticeable increase occurred after the death of Joseph Smith and prior to the departure of the Saints from Nauvoo. Ivins attributes this to the completion of the Nauvoo Temple during the winter of 1845 and 1846 to the point where it could be used. As a consequence, prior to their departure for the Rocky Mountains, the Mormons worked "feverishly" at performance of temple rites which resulted in a rise of polygynous marriages to a level not to be attained for another ten years.

After the initial increase, the rate fell and remained low until the public announcement of August, 1852. At this time there was another increase in the number of polygynous marriages performed, again followed by a sharp decline.

It was not until the autumn of 1856 and on into 1857 that the rate of plural marriages "skyrocketed" to an unprecedented high never attained before and never after. This was a period known as the Reformation, a period of excesses characterized by religious fervor, zeal, revivalism, rebaptism, confession, and reform. At this time single and monogamous males were exhorted and, it has been suggested at times, intimidated from the pulpit, by ward teachers, and by Brigham Young to take additional wives. According to Ivins (1955-56: 231-232)

> there were sixty-five per cent more of such marriages during 1856 and 1857 than in any other two years of this experiment.
>
> With the waning of the spirit of reformation, the rate of polygamous marrying dropped in 1858 to less than a third and in 1859 to less than a fifth of what it was in 1857. This decline continued until 1862, when Congress, responding to the clamor of alarmists, enacted a law prohibiting bigamy in Utah and other territories. The answer of the Mormons to this rebuke was a revival of plural marrying to a point not previously reached during the gala years of the Reformation.

The next period of minor acceleration in the number of polygynous marriages occurred between 1868 and 1869. This was a result of the introduction of a cooperative economic venture designed to protect Mormon economic self-sufficiency through large-scale cooperation and a boycott against Gentile merchants. This period also marked the organization of an anti-Mormon political party. According to O'Dea (1964:246), the number of plural marriages performed during this period was about half of that during the Reformation, although the church had doubled its membership. Ivins (1955-56:323) states that this "increased activity was short-lived and was followed by a slump lasting for a dozen years. By 1881 polygamous marrying had fallen to almost its lowest ebb since the public avowal of the doctrine of plurality."

The passage of the Edmunds Act marked the beginning of the last period of increased polygynous marriages. As the federal government began its most effective drive to eliminate polygyny, church officials urged members to oppose it by following the "Principle" in a more wholehearted manner than ever before (K. Young, 1954:74; Ivins, 1955-56:323). This period reached its peak in 1884 and 1885. But after this time, due to increasing imprisonment, with church officials in exile, and a general feeling of peril, there was a sudden decline in the numbers of polygynous marriages performed.

Although there were several periods in which the numbers and proportions of polygynous marriages performed increased, polygynous marriages never attained the number or proportions achieved during the Reformation. Moreover, after this time the proportion of polygynous marriages performed never increased as rapidly as the growth of church membership. Ivins (1955-56:239) reported that there were nearly fourteen times as many plural marriages for each one thousand Utah Mormons during the Reformation as there were in 1880.

2.3:2 Source and Number of Polygynous Wives

Although polygynous marriage may perhaps be facilitated by a sex-ratio imbalance favouring females, it is not dependent on such an imbalance as Caldwell (1963-64) and others have indicated. Being a pioneer society, it would be expected, however, that if an imbalance between the sexes did exist among the Mormons, it would favour males rather than females, a condition hardly conducive to the practice of polygyny. O'Dea (1964), Ivins (1955-56), and Smith & Kunz (1976) found, however, that this was indeed the nature of the sex ratio in Utah between 1850 and 1890. Men did tend to outnumber women, although the difference was only slight and far from as great as would be expected in a frontier society.

As Caldwell (1963-64) has pointed out, in a society where no sex-ratio imbalance occurs, polygyny can be maintained if men marry polygynous wives from younger age groups than themselves. In a society such as the one under consideration, where birth control is not practiced and where mortality levels are relatively low, the population pyramid displays a broadening base. Thereby the taking of polygynous wives from a much younger age group does not deprive males of the same age cohort of wives and polygyny can be maintained without forcing bachelorhood on large numbers.

However, N. Anderson (1942:400) claims that although the censuses of 1870 and 1880 report an equal number of males and females, a good share of the eligible males were gentiles (non-Mormons) and, therefore, unacceptable as prospective mates. According to him, there was a sex-ratio imbalance, if not among the general population, among the Mormons. Anderson asserts that this was due in part to foreign-born female converts, who also comprised a larger proportion of polygynous wives. He claims this occurred for two reasons.

1) Foreign-born female converts sometimes were older, between 25 and 35 years of age. Being unable to compete successfully with younger women for scarce young men, they willingly entered plural marriages.

2) Female converts frequently were sent to live with families of the same nationality. This proximity, coupled with social necessity, encouraged polygynous marriage.

It appears that in part younger women were one of the sources of polygynous wives in Mormon society. Ivins (1955-56:233-34) found that while 10 per cent of men married their last wives while still in their twenties, 38 per cent of plural wives were married while still in their teens and 67 per cent were married before the age of twenty-five. In addition, more than one-half of the men took their last wife before reaching the age of forty and "not one in five took a wife after reaching his fiftieth year." By contrast, only 30 per cent of plural wives married after the age of thirty, "a few had passed forty and about one in a hundred had . . . seen her fiftieth year."

Another limited source of polygynous wives was widowed and divorced females. An examination of genealogical records, the reading of texts and diaries written at this time, as well as contemporary research, make clear that, although the Mormon Church today does not countenance divorce except under special circumstances (that is, ecclesiastical divorce), during the period under examination it was not uncommon. However, as K. Young (1954:227) points out, "the whole process of separation and divorce, and possible remarriage was a hit-and-miss affair" at this time. Since plural marriages were ecclesiastical (temple) but not also civil, divorce was not granted by the Territorial or State courts and records of divorce are, therefore, rather sketchy. However, Mrs. Stenhouse (1865) relates that divorces were granted by Brigham Young.

It should be noted also that, as in other polygynous societies, at times polygynous spouses were sisters. In K. Young's (1954) study of about seventy-five families, it was found that 19 per cent of the men married sisters; and Ivins (1955-56) found that of a sample of 1,642 polygynists, 10 per cent married at least one pair of sisters. Since polygyny was a new institution among Mormons and, except for those born and reared in Mormonism, one generally in conflict with previous socialization, the marriage of sisters was perhaps perceived as an attempt to reduce friction in polygynous households. From the reading of personal diaries (cf. Farley), it appears that this may have, in fact, reduced conflict and tension where they might otherwise have occurred.

In addition to marrying sisters, some polygynists married first cousins; and from an examination of genealogical records, it is found that some men married step-daughters when they came of marriageable age. Moreover, there are cases where wives married their deceased husband's brother or brothers, who may or may not have already been polygynous. However, this was not an institutionalized practice as it is in other societies.

Although examples can be cited of Mormon males with exceptionally large numbers of plural wives, i.e. Brigham Young with twenty-seven, Jens Hansen with fourteen, Heber C. Kimball with forty-five, and so forth, it is generally agreed by church historians that only a small proportion of polygynists had married more than three wives. According to Ivins' (1955-56:233) research, of 1,784 polygynous males, 66.3 per cent had two wives, 21.3 per cent had three, and 6.7 per cent had four. Only 5.8 per cent had five or more wives. Similarly, Esshom's work reveals that 70.2 per cent married two women, 20.7 per cent three, and 9 per cent four or more women (Smith & Kunz, 1976:470).

2.3:3 Household and Conjugal Arrangements

In societies where polygyny has been an institutionalized marriage pattern for a considerable period of time, particular household arrangements and conjugal visitation patterns are frequently institutionalized. There was insufficient time for such established patterns to emerge and achieve normative status among Mormons, however.

Consequently, household arrangements varied. In some cases, all wives and their children shared a common household. In other instances, husbands provided each wife with a private residence within the community, in some instances within close proximity of co-wives and in others a distance from them. Other polygynous males established residences for various wives in more than one community. The type of living arrangement adopted appears to have depended to a great extent on the financial resources of the husband, his personal inclinations, and the compatibility of co-wives.

While in some societies, such as the Temne, a rotational system has been well developed which governs conjugal visits, no such system emerged among the Mormons. Conjugal visitation patterns again were an individual family determination.

2.4 Summary

Although Mormons practiced plural marriage for just somewhat over fifty years, this population effectually lends itself to a study of polygyny's effect, relative to monogamy's, on fertility. The emphases on childbearing, a prohibition of contraception, and an absence of coital restricting taboos optimizes the probability that natural fertility prevailed and that its level was affected by coital frequency alone uninhibited by factors not associated with polygynous family structure.

CHAPTER 3

THE PROBLEM, DATA SOURCE, AND ANALYSIS TECHNIQUES

It appears from previous research that apparent fertility differentials between monogamously and polygynously married women are, in part, related to intervening variables which are difficult, if not impossible, to control for by the very nature of the populations studied. This study seeks to explore the effects of polygyny, per se, as compared with monogamy on fertility by examining a homogeneous, pronatalist population in which contraception and coital-restricting practices are absent. For purposes of this study, a sample of L.D.S. (Mormon) pioneers residing within the confines of the "State of Deseret" and married prior to 1885 was utilized.

Although the polygynous and monogamous fertility of the Mormon population has been examined on two previous occasions, as cited earlier, this study proposes to utilize a different data source, to control for previously uncontrolled for factors in sample selection in an attempt to eliminate as many intervening factors as possible, and to examine variables heretofore not considered when investigating this particular population.

3.1 The Problem

Previous studies on the relative effects of polygyny and monogamy on fertility have either ignored, due to inadequate data, or made erroneous assumptions about the characteristics of polygynous family structure. To begin with, it is frequently assumed that polygynous wives are exclusively so. This is indeed true for some, but not all. In addition, it is implicitly presumed that the number of wives in a union is constant. However, as not all men acquire all polygynous wives at one time and due to the death or divorce of wives, the number of wives present during any one wife's marriage may fluctuate. As the polygyny-fertility hypothesis suggests that the number of wives present in a union affects their fertility, failing to control for these aspects of polygynous unions renders any test of this hypothesis inadequate and the findings inconclusive.

The problem investigated involves determining the following questions: 1) Do fertility differentials exist between women married monogamously and those in polygynous unions? 2) Do differential birth interval lengths obtain between the two types of marriage? 3) Do fertility differences exist between those women always married in monogamy, those exclusively polygynous, and those who experienced alternating patterns? 4) Among women married in alternating patterns, does the percentage of time spent in polygyny affect fertility? 5) Do differential fertility and length of birth intervals obtain for women of differing ordinal statuses? 6) Do the average number of wives residing in a polygynous household throughout a woman's fecund years affect fertility levels and the length of birth intervals? In addition, 7) is there a difference in fertility levels between marriage cohorts, and 8) do age differences between husband and wife affect fertility?

3.1:1 Hypotheses

Applying the polygyny-fertility hypothesis, discussed in Chapter 1, to the aforementioned problems to be investigated, the following hypotheses derive:

Hypothesis 1: If polygyny reduces coital frequency per wife, the mean protogenetic birth interval and the mean intergenetic birth intervals will be longer for women in polygynous unions relative to always monogamous women.

Hypothesis 2: If polygyny reduces coital frequency per wife, thereby increasing the mean length of birth intervals, polygynous women will have lower mean fertility relative to always monogamous women experiencing the same duration of marriage.

Hypothesis 3: If polygyny reduces coital frequency per wife, then, as the number of wives increases, the rate of coital frequency will decrease accordingly and the length of mean birth intervals will increase consistently and mean fertility will decline consistently.

Sub-hypothesis 3 (a): As the ordinal status of the wife increases, the greater will be the number of wives already present in the union. Therefore, as the ordinal status of the wife increases, the length of birth intervals will increase and fertility will decline.

Sub-hypothesis 3 (b): As the average number of wives present in a union increases, the greater the length of birth intervals and the lower the fertility.

Hypothesis 4: If polygyny reduces the rate of coital frequency per woman, the greater the amount of time spent in a polygynous union, the greater the amount of time exposed to reduced coital rates. Therefore, the higher the percentage of years married in a polygynous union, the lower the fertility.

3.1:2 Definition of Concepts

3.1:2a Monogamous Wife. A monogamous wife is one who was the sole wife of a husband through the woman's forty-sixth year. For purposes of this study, if a husband married an additional wife or wives after the initial wife's forty-sixth year, the initial wife is defined as having been monogamous. The rationale is that such a wife was monogamous throughout the duration of her childbearing years.

3.1:2b Polygynous Wife. A polygynous wife is one who at some time was married in a polygynous union, regardless of the duration of that union, between her marriage and through her forty-sixth year. Therefore, a woman who was initially a monogamous wife and whose husband married an additional wife or wives before the end of her forty-sixth year, for however briefly, is defined as a polygynous wife. As well, a woman who married into a polygynous union and later became a monogamous wife through the death or divorce of the co-wife or co-wives is defined as polygynous.

3.1:2c Ordinal Status. Ordinal status refers to the sequential status of the polygynous wife. For purposes of this study, the ordinal status does not refer to the number of the wife relative to the husband. Instead, a wife's ordinal status is determined by the number of wives already in a polygynous union at the time of her marriage. Therefore, if there are three wives present in a union at the time of a woman's marriage, she is assigned an ordinal status of four, although she may be the sixth woman her husband has married.

3.1:2d Average Number of Wives Present. As the number of wives present during a wife's polygynous marriage may fluctuate from year to year, and at times she may be a monogamous wife, the average number of wives present is the mean of the number of wives present at each year of marrige by the number of years married through age forty-six. (If, for example, there were one co-wife always present for each year of marriage, the average number of wives present would be two.) As a wife may enter or leave a marriage at any time during a particular year, the number of wives present during a particular year was determined by how many wives were present on June 30 of that year.

As computing the average number of wives present for each wife frequently results in a fraction, translating that to a whole number was done in the following manner: an average of 1.01 to 1.49 wives equalled an average of one wife, 1.50 to 2.49 wives equalled two wives, 2.50 to 3.49 wives equalled three wives, an average of 3.50 to 4.49 wives equalled an average of four wives, and so forth.

3.1:2e Percentage of Years Polygynous. Not all polygynous wives were exclusively so but spent a portion of their married lives in a monogamous situation. Percentage of years polygynous is the percentage of total years married through age forty-six which were spent in polygyny. As a wife's status may not have been consistent throughout a given year, her status, whether it was monogamous or polygynous, in a given year was determined by her status on June 30 of that year.

3.1:2f Protogenetic Birth Interval. The interval between marriage and first birth. For purposes of this study, the length of the interval is measured in months.

3.1:2g Intergenetic Birth Intervals. The interval, or time elapsed, between successive births. The length of the interval is measured in months.

3.2 Source of Data

As was previously indicated in Chapter 1, the inadequacy of customary data sources is one factor hampering effective analysis of putative fertility differentials in contemporary comparative studies of monogamous and polygynous marriages. In an attempt to overcome these deficiencies, genealogical records are utilized for this study.

The decision to utilize genealogical records rather than Esshom's work, *Pioneers and Prominent Men of Utah*, as did the two preceding studies of Ivins and Smith & Kunz, was based on the fact that this compilation disproportionately represents men who held formal positions within the ecclesiastical or political structures in Utah and Idaho, and, as Kunz and Smith (*Selected Papers*, p. 98) point out, included all men in Utah who held "either a religious or civic position such as mayor, county commissioner, legislator, bishop, stake president, etc." As the possibility exists that high status males may exhibit marital and fertility behaviour different from the general population, a sample drawn from this source risks being biased in the direction of their marital practices and fertility. Moreover, some wives included in Esshom's work had not completed fertility at the time the data were collected. It was decided, therefore, to use genealogical records housed in the L.D.S. Church Genealogical Archives as they were not preselected on some criteria over which the investigator had no control. It was believed that by utilizing this data base there was a greater probability of selecting a sample which would be representative of the practicing Mormon population.

Genealogical records known as Family Group Records housed in the genealogical archives of the Church of Jesus Christ of Latter-day Saints in Salt Lake City, Utah, therefore provided the data source for this study.

For ideological reasons, each Mormon family is encouraged to research its family genealogy for at least four generations; and these genealogies are recorded on Family Group Record sheets. It is expected that duplicates of these records will be placed in the aforementioned archive where they are kept on file in this original form. (In addition, some of the older genealogical records have been recorded on microfilm.)

Each Family Group Record contains the progeny of one man and one wife. If a man had been married more than once and all wives were fertile in those unions, there is, ideally, a separate genealogical record for each union. Since descendents are primarily responsible for compiling these genealogies, if a wife were barren in a union, there is frequently, though not always, no Family Group Record available for that union. Since these Family Group Records are compiled for each union, if a woman were married more than once, a record sheet for each union must be located in order to determine her total fertility. Moreover, since each family is expected to complete its genealogy for four generations, it is not unusual to find several

Family Group Record sheets for one couple, particularly where there are a large number of descendents.

3.2:1 Advantages of Using Genealogical Data

There are several major advantages in using genealogical records as opposed to conventional data sources in studying fertility. One major advantage is that information is identifiable for each individual rather than being aggregated as is the case with censuses and vital registrations. Aggregation limits the type and number of variables that can be calculated and cross tabulated, a problem eliminated to a great extent with genealogies. Genealogical data may be aggregated later, but it is initially nominative, thus making possible a more detailed final picture.

Another decided advantage is that information not obtainable from either censuses or vital registrations is available. For example, in the genealogies used for this study, the following raw data are standard: the date and place of birth of both spouses; the name of parents of both spouses; the date and place of death, as well as the date and place of burial, of both spouses; the date and place of marriage of the couple; the date and place of birth of each child, including stillbirths; the date of first marriage and the name of the spouse, if applicable, and the date of death of each child. In addition, divorce dates are frequently provided as are the names of additional spouses of both husband and wife, and at times the dates of these additional marriages. (It is then possible to obtain the above information for each of these additional unions where it is available.

Ideally, then, one should be able to find a complete fertility history for both males and females.)

In polygynous unions, the rank order of the wife is usually given, as well as the names of women ever married to a particular male. Moreover, temple ordinance data are available, such as dates of L.D.S. baptisms for husband, wife, and children; endowment dates for husband, wife, and children; and the date the husband and wife were sealed and the temple where the sealing was performed as well as the dates children were sealed to parents if they were not "born in covenant," that is, if the parents were not sealed to one another prior to the children's birth. Frequently, biographical information which may be of importance is included, e.g., the fact that an additional wife was a proxy marriage occurring after her death, a notation that a previous or later marriage for either husband or wife was childless, as well as additional marriages of children, and so forth.

From these raw data, other information can be derived, such as age at first marriage of both husband and wife, age differentials between husband and wife, age at death of both spouses, age of the wife at the birth of each child, the protogenetic birth interval, intergenetic birth intervals, the number of years between the first and last birth, the number of years spent at risk, the amount of time spent between discontinuous unions, as well as numerous other data. For polygynous unions, the average number of wives present during the union under consideration and the number of years at risk spent in polygynous unions are among other data which may be determined.

According to Knodel and Espenshade (1973:118), by using genealogical records, the number of variables that can be calculated and the relations between variables that can be explored are much more numerous. This permits studying a problem in greater depth than is possible with either vital registrations or censuses.

An additional advantage in using genealogies over censuses or vital registrations is the assurance that one is dealing with completed family size.

Of enormous advantage to the researcher in using this data source is that genealogies are comprised of reconstituted family data. If the researcher were to reconstitute the data for each family, it would be an exceedingly time-consuming task. For that reason, genealogies are a convenient source of data for historical studies.

3.2:2 Disadvantages of Using Genealogical Data

In spite of the advantages provided by genealogical records, they are not without limitation. As Knodel and Espenshade (1973:119) point out, it is difficult to obtain crude rates of birth, death, or marriage if desired since determining the size of the total population at any one time may be problematic.

Of great concern in using genealogical records is the possibility of errors. Errors are of two types and have two sources generally. Erroneous dates of birth, marriage, and death may accidentally be recorded by the genealogist or may have been omitted through oversight. However, with the genealogies to be used, obvious discrepancies can at times be corrected by consulting additional documentation, and missing information can at times be provided by the same means. Another source of error may be the original documents from which the data were drawn. It may be that erroneous dates were recorded in the original documents. In such instances, errors are more difficult to detect, unless blatantly obvious, and are more difficult to correct.

Another disadvantage in using genealogies, which also typifies censuses and vital registrations, stems from the fact that certain kinds of information can only be obtained from respondents and is, therefore, not available from genealogies. Some of the intermediate variables discussed by Davis and Blake (1955-56) are of this nature.

One such variable which affects fertility, and a variable which both Olusanya (1971) and Dorjahn (1958) claim should be controlled for in studies of this nature, is coital frequency. Obviously the use of genealogical records precludes determining this, if it were ever possible to determine.

The lack of this information may, however, be of insignificant consequence in this study. As K. Young (1954) points out, although one cannot account for individual differences, Mormons believed that intercourse was for the purpose of procreation only and not for baser pleasures. This is a point emphasized by Erastus Snow in 1885 and later by Richard L. Evans (1939) as well as others. Not knowing coital frequency, therefore, may not have serious consequences since it may not vary that much. Nevertheless, this is something which cannot be determined.

A factor which has been believed to affect fertility among polygynous women is favouritism, which, in turn, affects coital frequency. Among Mormons a rotational system such as Dorjahn (1958) found among the Temne had not emerged. Consequently, the amount of time a husband devoted to each wife was a personal decision mitigated by individual circumstances. Again, these differences and the effects they may have on fertility cannot be determined.

Another intermediate variable which cannot be controlled for when using genealogies is contraception. Although Mormon doctrine is opposed to such a practice, assurances cannot be given that the proscription was closely adhered to without questioning.

A problem peculiar to these genealogical records, particularly in the case of later polygynous marriages, was introduced as a result of the intensification of federal prosecutions for polygamy and illegal cohabitation after 1885. The problem is one of involuntary abstinence introduced through the separation of spouses either by imprisonment or an attempt to avoid such.

Although this researcher has identified some of the men imprisoned and, in some cases, the length of their sentences, usually six months, this has not been possible in all cases. Moreover, it is not known which wives were secreted in out-of-the-way places, sometimes at great distances from their husbands, or were sent home to live with their parents; nor is it known which men went into hiding via the underground railway or went on missions in an attempt to avoid prosecution.

In addition, some diaries, notably that of George Dunford, indicate that even after being released from prison some men were denied permission to visit with plural wives, and some, on threat of being returned to prison, were forbidden to even step onto the plural wife's property. Moreover, after the issuance of the Manifesto in 1890, some men ceased cohabiting with plural wives though never bothering to obtain a divorce.

These various factors which separated husband and wife could have affected fertility in individual cases, depending on the length of the separation and the age of the spouses, particularly the wife. The extent to which these events and practices would limit the fertility of the general polygynous population is open to speculation since sufficient information is lacking. The effects of involuntary abstinence cannot, therefore, be controlled for.

Nevertheless, in spite of the drawbacks and disadvantages of genealogical records, the data to be used in this study are far superior to those which have been used in the past in the analysis of polygyny's affect on fertility.

3.3 The Sample

For this study, a sample of L.D.S. females living within the confines of what was the "State of Deseret" and married in either polygynous or monogamous unions between 1840 and 1885 was utilized.

Several factors preclude drawing a probability ~~sample of~~ the population under consideration. To begin with, no records were ever kept of those L.D.S. males who were ever married in polygynous unions.

Moreover, as was stated previously, the proportion of polygynous unions at any one time is unknown. This lack of basic information about the composition of the population prohibits selection of a stratified random sample. Although the approximate numbers in the area can be ascertained, the proportion Mormon, let alone "active" Mormon, cannot be. Moreover, genealogical records are not necessarily available for all Mormon families who resided within the territorial limits of the "State of Deseret" between 1847 and 1885.

A third factor is that Family Group Record sheets are filed alphabetically rather than chronologically in the genealogical archive. As a result, the number of families for whom records are available for the population under consideration cannot be determined. Thus, even a random sample of records available is not possible.

As a result of these various factors, rather than either a random or systematic sample being used, it is necessary to employ a purposive sample. In spite of this, the principles of random sampling are applicable as the investigator selected each case which fit the criteria for inclusion as it was encountered. No other factors entered into the selection process. As a result of this type of selection procedure, extrapolation of the findings from the sample can be made to the similar Mormon population.

3.3:1 Criteria for Inclusion

In selecting the sample, several criteria were utilized.

To begin with, due to the problem of obtaining genealogical records for infertile women and because of the possibility of there being a greater proportion of infertile females in plural marriages, only fertile women were included in the sample.

Secondly, only women who were married between the years 1840 and 1885 were selected. If co-wives of a polygynous wife were married between these two dates, they were included in the sample; if a polygynous wife was married outside of these parameters, however, she was excluded, even though her co-wives may be included. (Her genealogical record was "pulled" to aid in establishing data pertinent to the other wives, but she was not included.)

A third consideration was length of residency in the territory. Since Mormonism was a new religion, many of those living in the prescribed territory during the period under consideration were converts. In an attempt to ensure that norms affecting childbearing were predominantly Mormon and not secular, and to limit the influence of secular norms on childbearing, only those cases in which one-half or more of the children were born in what comprised the "State of Deseret" were included. Consequently, women who converted in Europe, for example, and remained their during the birth of over half of their children before immigrating to Utah or other Mormon settlements were excluded.

A fourth criterion was religiosity. An attempt was made to ensure that only those individuals were included in the sample who were practicing members of the L.D.S. faith during the majority of their childbearing years. This consideration in selecting a sample is based on two factors. To begin with, there were non-Mormons arrested and convicted of practicing polygamy in Utah during the period under study. A mroe serious consideration, however, is that being baptized a Mormon at age eight does not guarantee that as an adult adherence will be given to the tenets of the faith.

In an attempt to separate non-Mormons from Mormons and "nominal" Mormons from "practicing" Mormons, one of the criteria for selection is that the husband and wife were married to each other in the prescribed temple ceremony and were sealed to one another "for time and all eternity." In conjunction with this, it is also necessary that at least one-half of the children of this union be "born in covenant," that is, be born after the parents were sealed to one another. Both of these conditions must be met for inclusion in the sample.

In the absence of direct questioning of subjects regarding observance of religious prescriptions and proscriptions, it is the opinion of this researcher that participation in these two ceremonies, temple marriage and sealing, is the best single indicator of compliance with religious norms.

Even when a union met the above criteria, it was excluded if it did not meet others. Problems in selection were frequently introduced where a male had more than a single wife and where a female had been in discontinuous unions.

Where a male had been married more than once, it is customary, though not necessary, that the date of marriage for each additional spouse to be listed on the Family Group Record sheet for each union.

At times, however, only the names of additional spouses appear. Frequently, Family Group Records are available for each of these additional unions. At times, however, they are available for only some, and at other times, they are available for none of the additional spouses. It is of minimum necessity to obtain the date of marriage for each of these; and in some cases, it is also necessary to obtain the date of death for additional wives.

Where minimal information regarding additional spouses is not included on available Family Group Records and where Family Group Records do not exist for additional spouses, it is necessary to utilize other sources of information, i.e., microfilmed records of marriages and sealings, obituaries, Family Group Record sheets of the husband's parents and the parents of the "missing" female, if either of these can be located, and so forth. For example, date of marriage, and at times, date of death, must be found in order to establish the status of the wife for whom the record is available, i.e., was she a monogamous or polygynous spouse.

Moreover, where a male, for example, had two wives and a Family Group Record is available for only one, with no date of marriage recorded for the additional spouse, it is necessary to determine the date of marriage. If the additional spouse was married after the death of the spouse for whom a genealogical record is available, then the union under consideration was monogamous. However, if the date of marriage for the additional spouse was prior to the marriage under consideration, that marriage may be either monogamous or polygynous.

It then becomes necessary to determine whether or not the additional spouse was deceased prior to the marriage under consideration. If she were deceased, again the union is monogamous. This information is also required where the date of marriage is available for an additional spouse and it is prior to the date of marriage of the union for which a Family Group Record is available. A male, for example, may have had three wives, each of them monogamous unions occurring after the death of each previous wife.

Since at times plural marriages were proxy marriages, it is also necessary to determine whether or not the plural wife was married after her death. If so, the plural marriage may have been temporally a monogamous marriage or involved fewer co-wives.

Where marriage and death dates could not be ascertained for additional wives so that the status of the female under consideration remains uncertain, she was excluded from the sample.

Another problem was encountered when attempting to reconstruct the marital history for women in discontinuous unions. Since Family Group Records are compiled for each husband and each wife, in order to determine a woman's total fertility, as well as to obtain other vital information, i.e., time spent between unions, Family Group Records for a female and each of her husbands, or other sufficient information, are required. At times there are notations on Family Group Records providing sufficient information about an additional husband, i.e., date of marriage, divorce, or death, a notation of "no issue from this union," and so forth. It may be however, that no Family Group Record nor sufficient information regarding one or more of these unions can be located. Unless it is unquestionably clear that the marriage(s) for which data are missing occurred after the woman's forty-sixth year, the female was excluded from the sample.

3.3:2 Characteristics of The Sample

The sample consists of 1,896 females who had a total of 16,738 children for a mean fertility of 8.83.

Of these women, 932, or 49.16 per cent, were always in monogamous unions, while 964, or 50.84 per cent, spent at least some portion of their fecund married years in a polygynous union. (Women who were monogamous spouses through their forty-sixth year and whose husbands acquired a plural spouse thereafter were defined, in terms of this study, as always monogamous, as this was the state of their marriage during their fecund years.)

It should be noted at this point that although the proportion of some-time polygynous women is somewhat higher than, though almost equal to, the proportion of monogamous women in this sample, this should not be construed as indicating that slightly over one-half of the "active" Mormon females in the region under consideration were married in polygynous unions at some time during their fecund years. The very nature of the data collection process would likely lead to this phenomenon. As it was necessary to acquire information on as many co-wives as possible, particularly those who were in discontinuous unions, and since the co-wives of these were also included, this led to an inclusion of more polygynous spouses than would have likely occurred by chance.

Of those women in monogamous unions, 27, or 2.9 per cent, were in discontinuous unions compared to 108, or 11.2 per cent, of those who were in polygynous unions at some time.

A greater percentage of ever polygynous women entered their first marriage at both younger and older ages than was true for monogamous women, who tended to concentrate entering of first marriage in fewer age categories (refer to Table 2). The median age of first marriage for both groups was 19 years. However, of monogamous women, 45.8 per cent entered their first unions at either ages 17, 18, or 19 while only 37.2 per cent of ever polygynous women entered their first unions at these ages.

Of ever polygynous women, 15.4 per cent were married for the first time prior to age 17, which was true for only 12.7 per cent of those women who were always monogamous. By age 21, 75 per cent of always monogamous women had entered their first union, which was not true of ever polygynous women until age 22. By age 23, 90 per cent of always monogamous women had entered their first union, while this did not occur for ever polygynous women until age category 26 to 29. After age 25, twice the percentage of ever polygynous females married for the first time as did always monogamous females.

For women who were ever married in polygynous unions, significant differences exist in the percentage of time spent in polygynous unions based essentially on the ordinal status of the wife.

Table 2. Age at First Marriage for Always Monogamous and Ever Polygynous Females

Age at Marriage	Monogamous N	Monogamous %	Polygynous N	Polygynous %
15 or Under	54	5.79	58	6.02
16	64	6.87	90	9.34
17	132	14.16	115	11.93
18	168	18.03	121	12.55
19	127	13.63	123	12.76
20	100	10.73	92	9.54
21	82	8.80	66	6.85
22	80	8.58	69	7.16
23	40	4.29	55	5.71
24	16	1.72	40	4.15
25	22	2.36	24	2.49
26 to 29	32	3.43	65	6.74
30 to 33	12	1.29	31	3.22
34 and Over	3	0.32	15	1.56
Total	932	100.00	964	100.00

As is to be suspected, most polygynous first wives spent only a fraction of their married fecund years in polygynous unions. If only continuously married women married through age 46, regardless of age at first marriage, are examined, it is found that only 2 per cent of first wives spent 100 per cent of those years in polygyny while 36 per cent spent 75 per cent or more but not 100 per cent of their married years in a polygynous union. The majority of first wives, or 40 per cent, spent between 50 and 75 per cent of their married years in polygyny, while almost half this number, or 22 per cent, spent less than 50 per cent of their marriage in a polygynous union.

Although few first wives spent their entire married lives in polygynous unions, these being initially-polygynous first wives, this was not true for wives of higher ordinal status. By contrast, 84.49 per cent of second wives spent their entire fecund married life in a polygynous union, while slightly over 10 per cent spent at least 50 per cent but not 100 per cent of those years in polygyny. Of second wives, only 4.09 per cent spent less than 50 per cent of their married years in polygyny.

Of third wives, 94.94 per cent spent 100 per cent of their fecund married years in a polygynous union, while only 5.06 per cent spent less than 100 per cent of their married years in polygyny. No third wife spent less than half her married life in polygyny. All wives whose sequential status was four or greater spent their entire married life to age 46 in a polygynous union.

Of the 1,896 women in the sample, 100, or 5.3 per cent, entered their first marriage prior to 1848; 394, or 20.8 per cent married between 1848 and 1857 inclusive; 431, or 22.7 per cent, married for the first time between 1858 and 1867; while 546, or 28.8 per cent, were married between 1868 and 1877; and 425, or 22.4 per cent, entered their first union between 1878 and 1885.

3.4 Analytic Technique

As this study is essentially exploratory in nature, simple statistical techniques will be employed to determine whether substantial differences obtain in the length of mean birth intervals and mean completed fertility between monogamous and polygynous samples and between specific categories of polygynous women.

Initially, cross tabulations will be employed to determine the mean length of birth intervals and completed fertility for and between different categories.

In addition, parity progression ratios will be constructed. These will be used to compute the distributions of family sizes for projected populations of 1,000. In such a manner, it can be determined, if samples had been of the same size, not only whether or not different distributions of family sizes existed but also the extent of these differences for the different categories. Moreover, it can be shown how these different patterns affected mean fertility levels. The technique chosen for computing these projected distributions is borrowed from Pressat (1972:219-222).

CHAPTER 4

MONOGAMOUS FERTILITY

Preliminary to analyzing polygynous fertility, it is advantageous to first examine the fertility of monogamous Mormon women. Although the focus of the study is polygynous fertility, it is first necessary to establish the fertility levels of monogamous women in order that these may be used as bases for comparison with polygynous fertility and thereby provide meaningful indices of differences once variables purported to depress polygynous fertility are introduced.

To reiterate, in nineteenth-century Mormonism, purposive attempts at fertility limitation were prohibited, intercourse was prescribed for procreative purposes only, and large numbers of children were deemed desirable for both temporal and celestial reasons. Since the data are historical and adherence to ecclesiastical dictums cannot, therefore, be verified directly, it can only be assumed that conformity predominated and that the population was one in which natural fertility prevailed.

It is advantageous to this study that the natural fertility of a somewhat similar twentieth-century population (similar in terms of religious fundamentalism, prohibition of fertility limitation, endogamy, and isolation), the Hutterites, has been extensively examined (cf. Eaton & Mayer:1953: Dandekar:1963; Sheps:1965-6; Tietze:1957;

James:1963-4; and Bodmer & Jacquard:1968). The findings regarding the natural fertility of this population will be employed as a comparative model in analyzing monogamous Mormon fertility to ascertain whether or not it can be stated with some assurance that natural fertility was, indeed, characteristic of the nineteenth-century Mormon population.

4.1 Mean Fertility Levels for Monogamous Women

An examination of the fertility of monogamous wives revealed that these Mormon women experienced unusually high mean fertility levels. The mean fertility for all monogamous wives (932), controlling for no variable other than monogamy, was 9.42, the median being 9.69, the mode 11.00, and the standard deviation 2.92, as can be observed in Table 3.

As with the Hutterite women studied by Eaton and Mayer (1953), the high fertility levels of monogamous Mormon women were not a consequence of a few couples having exceptionally large numbers of children but rather were a result of generally high fertility levels throughout, as are reflected by the levels of variance and coefficients of variability (Table 4) as well as by the parity progression ratios (Table 5). Moreover, of the 749 monogamous females continuously married through age 46, one had as many as 20 children, two of her confinements being the birth of twins, none had but one child, and only two couples had but two children.

Table 3. Frequency Distribution of Family Size for All Monogamous Women

Family Size	Absolute Frequency	Relative Frequency	Cumulative Frequency
1	6	0.6	0.6
2	11	1.2	1.8
3	16	1.7	3.5
4	27	2.9	6.4
5	39	4.2	10.6
6	49	5.3	15.9
7	61	6.5	22.4
8	103	11.1	33.5
9	127	13.6	47.1
10	139	14.9	62.0
11	147	15.8	77.8
12	83	8.9	86.7
13	71	7.6	94.3
14	26	2.8	97.1
15	16	1.7	98.8
16	8	0.9	99.7
17			
18	2	0.2	99.9
19			
20	1	0.1	100.0
Total	932	100.0	

Mean: 9.422
Median: 9.694
Mode: 11.000
Variance: 8.519
Standard Deviation: 2.919

Table 4. Fertility of Continuously and Discontinuously Married Monogamous Females by Age at Marriage and Duration of Marriage

	Age Through Which Married																			
Age	Age 46 and Over				Age 40 to 45				Age 34 to 39				Age 28 to 33				27 and Under			
	N	$\bar{X}$	σ^2	V	N	$\bar{X}$	σ^2	V	N	$\bar{X}$	σ^2	V	N	$\bar{X}$	σ^2	V	N	$\bar{X}$	σ^2	V
15 C	41	12.0	7.4	23	3	10.3	0.2	5	4	7.8	0.7	11	2	7.0	1.0	14	1	5.0	0.0	0
D	2	13.0	1.0	8	1	10.0	0.0	0												
16 C	50	11.2	7.0	24	1	11.0	0.0	0	6	10.2	1.5	12	3	7.0	2.7	23	3	4.0	0.7	20
D	1	13.0	0.0	0																
17 C	104	11.1	6.6	23	8	10.3	2.9	17	7	9.0	1.1	12	5	6.0	1.2	18	2	3.0	1.0	33
D	4	10.3	4.7	21	2	9.0	1.0	11												
18 C	129	10.6	7.8	21	16	9.6	5.5	24	8	8.4	1.5	15	6	5.0	0.7	16	3	2.0	0.7	41
D	4	8.5	7.3	32	2	8.5	0.3	6												
19 C	107	10.8	5.1	21	9	8.9	1.0	11	4	8.0	2.5	20	4	4.8	6.2	52	1	3.0	0.0	0
D	2	6.5	2.3	23																
20 C	82	9.1	7.0	29	11	8.7	5.1	26	2	8.0	4.0	25	4	4.0	1.5	31				
D	1	7.0	0.0	0																
21 C	71	9.1	5.3	25	3	10.0	0.7	8	3	8.0	0.7	10	4	3.8	7.7	74				
D	1	13.0	0.0	0																
22 C	69	9.3	5.1	24	5	8.0	2.8	21	2	5.5	5.5	43	4	3.3	1.7	40				
D																				
23 C	28	8.8	5.1	26	3	8.3	1.6	15	2	6.0	0.0	0	4	3.3	2.2	46				
D									2	7.5	2.3	20								
24 C	12	7.8	3.3	23	2	6.0	4.0	33					2	2.0	0.0	0				
D																				
25 C	18	7.9	3.2	23	2	8.5	0.3	7												
D	1	7.0	0.0	0	1	4.0	0.0	0												
26-C	24	7.4	4.7	29	3	8.0	14.0	47	3	3.0	4.7	72								
29 D	2	4.5	2.3	33																
30-C	11	4.7	2.4	33																
33 D																				
34+C	3	4.7	1.6	27																
D																				

Table 5. Parity Progression Ratios for Monogamous Women Continuously Married through Age 46 by Age at Marriage

Ratio	Age at Marriage													
	-15	16	17	18	19	20	21	22	23	24	25	26-9	30-3	34+
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00	1.00	1.00	.99	1.00	1.00	1.00	1.00	1.00	.91	1.00
4	.98	1.00	.99	.99	1.00	.95	1.00	.99	1.00	.92	.94	1.00	.90	.67
5	.98	1.00	.99	.99	.98	.99	1.00	1.00	.96	1.00	1.00	.92	.67	.50
6	1.00	.96	.99	.99	.96	.97	.94	.96	.96	1.00	.88	.82	.50	
7	.97	.98	.98	.98	.98	.93	.89	.89	.85	1.00	.93	.89	.33	
8	1.00	.96	.96	.97	.96	.86	.95	.91	.86	.82	.93	.63		
9	1.00	.96	.96	.91	.85	.80	.80	.91	.74	.22	.54	.70		
10	.95	.93	.85	.85	.86	.77	.56	.63	.57	1.00		.71		
11	.92	.78	.86	.70	.54	.68	.60	.67	.75	.50		.40		
12	.79	.65	.59	.55	.58	.52	.53	.40	.50			.50		
13	.73	.80	.64	.46	.55	.54	.25	.38	.33					
14	.47	.38	.36	.31	.50	.29								
15	.33	.67	.67	.80	.33									
16	.33	.75	.50	.50										
17		.33	.67											
18			1.00											

As continuously married women do not experience an interruption in exposure to coitus, as do those divorced or widowed and remarried, it has been hypothesized that their fertility levels will be higher relative to those of women married more than once. If this is in fact the case, including those in discontinuous unions when computing fertility would depress the mean. Consequently, the fertility of women in continuous and discontinuous unions are considered separately.

However, selecting out discontinuous unions, which numbered only 27, did not alter fertility levels significantly. The mean fertility for all wives in continuous unions was increased by only 0.81, the fertility of women in discontinuous unions being 8.63 compared to 9.44 for women in continuous unions. Consequently, in this population discontinuous unions had little bearing on the overall fertility of monogamous marriages.

As age of marriage and duration of marriage are two basic and important variables affecting exposure to intercourse and conception, these two variables were controlled for to determine their effects on fertility levels. Initially, only monogamous women continuously married for a minimum of 20 years, regardless of age at marriage, were examined. The mean fertility for this group was 9.87, the median being 10.02, and the mode 11.00, with a standard deviation of 2.61.

As would be expected when controlling for age of marriage and duration of marriage (when duration equals age through which married), as age of marriage increased and/or duration of time spent in marriage decreased, mean fertility levels generally declined, as can be observed in Table 4. It is worth noting, however, especially for those married through age 46, that as age at marriage increased by one year fertility did not decrease by one birth. Moreover, marked fertility declines did not occur from one age at marriage to the next until after age-at-marriage category 26 to 29 years.

When only those women continuously married through age 46 were considered, the average completed family size was 9.97, the largest mean completed family size being 13.0 for those married at both age 15 or before and at age 16 and the smallest average completed family size being 4.5 for those marrying at ages 26 to 29.

The numbers of women married in discontinuous unions through age 46, particularly by age at marriage, were too small to be meaningful. As well, the numbers of women married in both discontinuous and continuous unions through age 45 or younger were also small. Consequently, only monogamous women in continuous unions through age 46 will be considered throughout the remainder of this study.

4.2 Mean Fertility of Monogamous Mormons Relative to Hutterites

A comparison of the fertility of monogamous Mormon women with that of Hutterite women disclosed that there was a good deal of similarity between the two.

Although the median age at marriage for monogamous Mormon women continuously married through age 46 was somewhat lower than for Hutterite women, 19 years compared to 22 years, their median level of fertility was essentially the same when compared to Hutterite women married before 1921, 10.6 for Mormon women compared to 10.8 for

Hutterite women. Moreover, the fertility of Mormon women married at age 18 and married through age 46 was essentially the same as that for Hutterite women married at the same age before 1921, again 10.6 compared to 10.8.

Eaton & Mayer (1953:233), assuming that Hutterites were not "genetically unusual," used the fertility of women who were alive on December 31, 1950, to estimate the "number of live children women can conceive after any given age," as is shown in Table 6. Using their estimates and comparing them where possible, as they are in five-year intervals, with the actual average completed family size for Mormon women, it is clear that monogamous women were experiencing fertility levels very similar to those of Hutterite women.

It is somewhat surprising, in the light of Eaton & Mayer's findings, that Mormon monogamous fertility should approximate so closely the experiences of Hutterite women still alive in December, 1950. Eaton and Mayer (1953:231) found that fertility for Hutterite women was not stable over time. Women married prior to 1921 had fertility lower than women married later, and women married between 1921 and 1930 had fertility levels lower than those married between 1931 and 1940. They attributed this to the increasing good health of the population resulting from improved diet and medical care. As has been demonstrated in past studies, improved health increases fertility by decreasing the number of spontaneous abortions, miscarriages, and stillbirths and leads to a reciprocal rise in successful parturition. Moreover, improved health increases fecundability so that the number of conceptions may also increase.

Table 6. Number of Children Still Possible Per Woman After Any Given Age. (Based on Hutterite Women Alive on December 31, 1950.)*

Age	Number of Children
50+	0.02
45	0.19
40	1.24
35	3.21
30	5.46
25	8.00
20	10.82
15	11.95-13.85

*Eaton & Mayer, 1953:233.

Although the Mormon population under consideration married between 1840 and 1885 and lived under frontier conditions, and although it is highly improbable that diets, health care, and living conditions were as adequate as those experienced by Hutterite women married prior to 1921, Mormon fertility rates were essentially equivalent to Hutterite fertility rates. It might be presumed, therefore, that, had the same environmental conditions prevailed for this population of Mormons as existed for Hutterites, their fertility would have been even higher than it was.

4.3 Birth Intervals for Monogamous Women

One of several factors affecting the mean number of children born in a population is the mean number of months between confinements. Therefore, before it is possible to determine whether or not there were differences in child-spacing practices between the monogamous and polygynous populations, the mean length of birth intervals for monogamous women must be determined.

4.3:1 Protogenetic Birth Intervals

The protogenetic birth interval (the interval between marriage and first birth) tends to be the shortest of all birth intervals, particularly where natural fertility prevails and suckling of infants is practiced.

Controlling for age at marriage for those monogamous women continuously married through age 46 revealed that mean protogenetic

Table 7. Birth Intervals for Monogamous Women Always Married Through Age 46 by Age at Marriage

Birth Interval	Age at Marriage														X̄ Interval
	-15	16	17	18	19	20	21	22	23	24	25	26-9	30-3	34+	
1	16.8	15.5	14.6	13.8	14.5	16.0	13.8	13.3	14.3	12.7	17.9	15.2	15.0	10.0	14.4
2	23.3	25.0	21.4	22.6	24.3	24.5	25.3	21.9	20.8	21.4	25.7	22.6	22.0	20.7	24.5
3	25.7	26.2	24.3	26.0	25.5	24.9	25.9	26.2	24.9	25.1	26.3	28.0	30.7	34.0	25.7
4	26.5	25.6	26.5	27.3	27.6	25.6	27.5	28.7	27.3	30.3	26.1	29.8	37.2	18.0	27.2
5	25.7	28.5	27.1	26.8	30.6	30.8	30.1	27.6	27.5	25.8	27.8	28.0	37.2	19.0	28.4
6	27.8	29.3	29.3	28.1	27.7	30.1	29.9	29.4	28.9	31.3	32.5	26.4	33.2		28.9
7	26.0	27.8	28.4	29.6	29.7	32.8	30.6	25.5	31.2	33.7	29.6	29.5	33.3		29.5
8	26.5	28.7	30.8	30.5	33.4	32.1	30.1	27.4	30.9	29.1	30.2	28.6	32.0		30.5
9	26.8	28.5	29.3	29.4	31.1	31.9	32.8	35.3	24.6	29.5	41.9	24.6	87.0		30.4
10	39.9	30.5	30.2	32.8	32.4	29.5	26.9	30.8	22.6	18.5		21.4			29.9
11	27.7	32.5	30.5	31.0	32.4	31.6	25.9	29.0	22.3	32.0		22.0			30.3
12	35.6	27.9	30.4	34.8	30.2	27.7	34.3	32.1	19.7			28.0			32.8
13	35.3	32.6	30.3	49.3	28.8	32.7	37.5	36.0	39.0						34.3
14	28.2	24.7	24.1	33.8	30.3	45.5									28.9
15	22.7	28.5	21.5	54.0	44.0										32.0
16	16.0	41.7	22.3	31.0											30.0
17		18.0	25.5												23.0
18			28.5												28.5
X̄ Intergenetic Interval	27.1	28.5	27.1	32.5	30.6	30.7	29.7	29.2	26.6	27.7	30.0	26.3	40.4	22.9	28.5

intervals were similar across categories and showed neither consistent increase nor decrease relative to increasing age at first marriage, as can be observed in Table 7. Excluding those women married at age 34 or over, due to the extremely small numbers involved in these categories, mean protogenetic intervals ranged from a low of 12.7 months for those married at age 24 to a high of 17.9 months for those married at age 25, with a weighted average of 14.6 months for all categories.

4.3:2 Intergenetic Intervals

An examination of mean intergenetic birth intervals by age at marriage also revealed that, although there was a tendency for the earliest birth intervals generally to be shorter than the later ones, no consistent pattern of increase occurred with increasing parity. Instead, the differences between parities within each of the age categories tended to be irregular. As well, at times an interval was greater than the preceding one and at other times shorter. However, the length of the first intergenetic birth interval was consistently greater than the protogenetic birth interval. The differences between the mean protogenetic interval and the mean first intergenetic interval ranged from 11.5 months for those married at age 21 to 6.4 months for those married at age 15 or before. The differences between these intervals most probably were a result of the inhibiting effect of post-partum ammenhorea on conception; this factor being absent between marriage and first birth.

Further, one would anticipate that as age at marriage increased the length of the mean intergenetic birth interval would also increase. However, when the mean intergenetic birth interval was computed for each age at marriage, there was, again, no consistent pattern of increases or decreases relative to these. Mean intergenetic birth intervals for each age of marriage ranged from 26.6 months for those married at age 23 to 40.4 months for those married at ages 30 to 33.

4.3:3 Mormon Relative to Hutterite Birth Intervals

Further comparison between Mormon monogamous fertility and Hutterite fertility can be made through use of Sheps' analysis of the latter. Sheps (1965-66), using data collected in 1953 and 1958-61, examined birth intervals of Hutterite women married through age 45. She found that a short birth interval existed between births of any order,

> it being in general well under two years. Proceeding through successive births, there is again a slight, not completely consistent, tendency for the mean interval to increase with birth order. The estimated mean interval to the second birth is 19.2 months, only 6 months longer than that to the first birth. The estimated mean interval to births 3 and 4 are under 21 months, to births 5 and 6 they are under 23 months, and only with birth number 10 can they be said to be 2 years or more (p. 74).

When comparing the mean birth intervals for the 749 monogamous Mormon women continuously married through age 46 with Sheps' findings, it is found that not only was there a tendency for the mean interval to increase with birth order but the mean length of birth intervals for monogamous Mormon women was also somewhat greater. While Sheps, for example, did not encounter average birth intervals of 24 months or longer until the tenth parity, average birth intervals of 24 months or greater were found for Mormon women at second parity.

As the somewhat greater length was found between the intergenetic intervals rather than between the protogenetic interval, as will be discussed, it may be assumed that intermediate sociological variables rather than biological differences were responsible. Since lactation affects fecundity to some extent, it is possible that, while both populations breastfed their infants, for Mormon women it was for a more extended period. Moreover, it is possible that norms regarding resumption of sexual intercourse prevented exposure to conception for a longer period, although there is no evidence to support this.

Whatever the reason for the differences, when average birth intervals were computed for all women by birth order and compared with similar data by Sheps, it was found that the average for the first interval was 14.6 months long, approximately one month greater than Sheps found among Hutterite women. However, while Sheps found the second interval to be 19.2 months, the mean length of this interval for all monogamous women married through age 46 was 23.2 months, this being 8.6 months greater than the first interval and two months longer than Sheps found to be the case among Hutterites. Moreover, in comparison with Hutterite women, the average interval between births 3 and 4 was 27.3 months and between births 5 and 6 was 28.9 months. At birth number 10, the mean interval was 31.8 months, a little more than 6 months greater than that found by Sheps.

As with Sheps' findings, there was a slight, but not consistent, increase from one mean birth interval to the next higher one until the tenth parity. After this point, there were decreases as well as increases in the number of months between parities, and after the fifteenth parity the average time between parities decreased. As Sheps (1965-66:74) pointed out in her analysis, and as was also true in the present case,

> the inclusion of all births of a given order in each calculation regardless of the eventual size of completed family, tends to obscure the relation of birth order to mean interval, since large families with short intervals would have greater relative representation at the higher birth orders.

4.3:4 Birth Intervals Relative to Completed Family Size

As a result of the above mentioned situation, the mean duration of birth intervals was examined for completed families with from 3 to 16 children, as can be seen in Table 8. Two families with 2 children, two with 18 children, and one with 20 children were omitted from the analysis due to the small numbers in these categories.

4.3:4a Protogenetic Intervals. Generally speaking, it was found that as the size of the completed family increased mean birth intervals decreased across each parity.

More specifically, protogenetic intervals, which were the smallest for each family size, tended to decline as family size increased, although this pattern was irregular. That is to say, women who had larger families of 12 and more children tended to have their first child seven to ten months sooner after marriage than those women with smaller families of six or fewer children.

Table 8. Average Birth Intervals for Monogamous Women by Total Number of Children Born

Birth Inter- val		Total Number of Children													
		3	4	5	6	7	8	9	10	11	12	13	14	15	16
	(N)	(10)	(14)	(25)	(35)	(44)	(79)	(99)	(116)	(127)	(80)	(68)	(24)	(15)	(8)
1		20.1	21.4	18.4	18.8	16.5	14.5	13.3	15.0	13.9	13.1	11.7	13.3	13.1	11.5
2		28.8	26.7	25.1	28.7	25.8	24.3	23.9	23.5	22.3	21.8	20.6	20.6	20.3	18.9
3		35.0	44.2	30.7	30.8	27.6	27.3	25.2	25.3	24.1	24.9	21.9	23.0	20.9	14.8
4			36.9	36.0	36.6	34.3	29.7	27.8	27.0	24.1	24.0	23.1	21.9	20.2	22.9
5				47.0	39.4	33.8	33.0	28.3	26.9	26.0	25.1	24.3	23.4	21.9	17.4
6					48.7	34.6	32.2	29.3	29.0	26.0	25.4	25.0	23.4	22.5	19.8
7						44.1	38.3	31.8	28.0	26.3	25.2	24.7	25.0	22.4	24.5
8							44.6	34.4	29.7	28.9	26.3	25.5	23.5	21.5	18.6
9								43.7	30.9	28.7	25.9	25.7	22.8	22.4	21.6
10									34.4	32.9	30.1	26.5	29.0	23.7	21.8
11										35.4	30.5	26.4	26.1	27.1	20.0
12											38.0	29.8	29.7	22.6	23.6
13												41.3	28.9	24.7	22.1
14													30.6	30.7	27.5
15														47.2	19.4
16															33.3
X̄ Intergenetic Birth Interval		28.8	35.5	30.6	33.9	31.2	30.8	28.7	27.5	26.6	25.9	24.9	24.8	23.2	20.9
X̄ Reproductive Span		7.0	10.8	13.1	16.9	18.1	20.3	21.5	24.5	24.1	25.9	27.2	28.4	30.1	28.1

4.3:4b Intergenetic Intervals. In contrast, the final intergenetic interval was found to be greater than the rest, regardless of parity, and appeared not to be affected by completed family size as no discernible pattern of increasing or decreasing mean interval lengths was noted. However, the mean length of all intergenetic intervals, excluding the final one, for each completed family size showed a consistent decline after a completed family size of five children.

It appears, from Table 8, that there was no relationship between mean birth interval length and completed family size until a family size of five was attained. After that point, there was a small but consistent decrease in the mean number of months between births, ranging from 0.1 to 2.7 months, as the size of completed families increased. These mean intergenetic intervals ranged from 35.5 months for those with a completed family size of four children to 20.9 months for those with a family of 16 children.

When examining all birth intervals for each completed family size, it can be seen that as parity increased the mean number of months between birth intervals also tended to increase, although, again, this was irregular. What was found, however, was that as family size increased the length of time between parities increased more slowly. To begin with, except for those with three or four children, the increase in the first intergenetic interval over the protogenetic interval was 9.3 to 9.9 months up to and including families with nine children. For those with from 10 to 13 children, there was an increase in this interval of from 8.4 to 8.9 months over the previous interval, and for those with 14 to 16 children, inclusive, an increase of 7.2 to 7.4 months was shown.

Those women with completed family sizes of ten or fewer children had birth intervals of two years or greater by the second parity. This level was not achieved by women with 11 or 12 children until the third birth interval and by women with 13 children until the fifth interval. Women with 14 children did not have a birth interval as great as two years until the seventh interval, and women with 15 children did not attain an interval of this length until the tenth one. Finally, women with 16 children did not spend, on the average, as much as two years' time between the birth of children until the birth of their twelfth child.

Not only did the mean length of birth intervals tend to decline as family size increased but the average amount of increase in length between intergenetic levels with increased parity also tended to decline as family size increased. Again, this was inconsistent.

The average amount of increase between intergenetic levels was greatest for families of five children, where an average increase of 6.6 months between intervals was exhibited. As family size increased, the mean amount of increase between intervals declined to 0.83 months for a completed family size of 14 children. The mean amount of increase between intervals for those with 15 and 16 children was 2.07 months and 1.03 months respectively. This was due, basically, to the large increase between the length of the final birth interval over the previous one in each case. Moreover, these tended to exhibit the greatest amount of increase found between any other two intervals.

When these final intervals were removed from the calculation, the mean amount of increase in the length of birth intervals for families with 15 and 16 children became 0.89 months and 0.04 months respectively.

4.3:4c Reproductive Span. Not only did females who had different completed family sizes experience differential birth interval lengths and differences in mean increase of length of birth intervals between each successive parity but the mean number of years spent in reproductive behaviour (reproductive span) from marriage to the birth of the last child also varied.

As can be seen in Table 8, the total number of children in a family is positively associated with the mean number of years in the reproductive span until a completed family size of 15 was reached after which point the association is negative. The mean reproductive span for women with a completed family size of three children was 7.0 years compared to a mean of 30.1 years for women who had borne a total of 15 children, and 28.1 years for women with 16 children.

4.3:5 Mormon and Hutterite Birth Intervals by Family Size

When the mean birth intervals for monogamous women were compared to those of the Hutterite women analyzed by Sheps (1965-66:70) on the basis of completed family size, ranging from 3 to 15 children, it was found that birth intervals for Mormon women were, in the majority of cases, longer.

4.3:5a Protogenetic Intervals. A comparison of mean first birth intervals revealed that the intervals of Mormon women with smaller families exhibited greater positive differences than did the mean intervals for women with larger families when compared with the mean intervals of Hutterite women.

For example, the difference between the mean intervals for women with seven or more children, excepting those with ten, was never as great as that for those with six or fewer children. In addition, for women with a total of eight children, the mean protogenetic birth interval was 5.9 months shorter than that of their Hutterite counterparts.

Nevertheless, the differences between the mean protogenetic intervals was never great. The range of differences for those with six or fewer children was from 2.6 months to 6.7 months, while the range of differences for those with seven or more children was, generally, 0.4 months to 2.0 months.

4.3:5b Intergenetic Intervals. When comparing the means for all intergenetic intervals by completed family size, excluding the final one, it was found that the mean intergenetic intervals for Mormon women were greater than the means for Hutterite women regardless of family size. Again, the differences between the intervals for women with six or fewer children were greater than for those with seven or more children, ranging from 5.5 months to 14.3 months. The differences between the means for women with seven children or more ranged from 1.1 to 5.0 months greater.

The mean of the final birth intervals for Mormon women generally tended to be much larger than those for Hutterite women. Moreover, the differences between the means of these final intervals tended to be greater than the differences between the means of all others. Where positive differences existed, they ranged from 9.0 months to 20.5 months greater for Mormon women than for Hutterite women.

4.3:6 Mormon and Hutterite Reproductive Spans

As is to be expected in the light of these findings, the mean reproductive span of Mormon women compared to their Hutterite counterparts was longer, ranging from 0.4 years to 5.4 years greater.

However, the largest differences between mean reproductive spans were found for those with larger families, although this was not consistent. There existed no differences between mean reproductive span of Mormon and Hutterite women as great as four years for those with six or fewer children. Moreover, the difference between the mean reproductive span for those with seven children was smallest at 0.4 years. However, mean differences of from 4.0 years to 5.4 years were found for half the categories beyond this.

4.4 Natural Fertility

4.4:1 Health Standards and Natural Fertility

It is evident that birth intervals tended to be somewhat longer for Mormon women than for Hutterite women. As well, the average fertility of Mormon women was somewhat less. Again, this perhaps was partially related to the standard of living of the two populations. As Sheps (1965-66:78) and others have pointed out, the Hutterite population had "high levels of health and nutrition; in fact they are at the standard of highly developed countries." It is highly improbable, as was pointed out previously, that Mormon women even approximated the same levels. Potter (1975), among others, has outlined some of the effects of nutrition on natural fertility levels.

It is also possible that the longer birth intervals were in part a consequence of a higher proportion of miscarriages and spontaneous abortions. These events, however, were not recorded in the genealogical records that form the data base for this study. However, this factor was most probably insignificant. According to Potter (1963-64: 158), "the intervals so affected represent only a minority of all birth intervals, so that the effect of spontaneous pregnancy wastage taken across all birth intervals proves rather moderate." We may, therefore, infer that pregnancy wastage contributed only minimally, if at all, to the differences found in the length of birth intervals between Mormon and Hutterite women.

4.4:2 Lactation and Fertility

A more important factor affecting variation in birth intervals between populations is lactation. Potter (1975:36) asserts that lactation practices are the "single most important differentiator of natural fertility." Lactation results in an increased period of post-partum amenorrhoea; and, according to Potter (1963-64:156), prolonged lactation extends the mean length of the birth interval by 11 months. Moreover, Sheps (1955-56:77), too, claims that "in non-contracepting populations, the most important determinant of the length of birth intervals is the duration of post-partum infecundability rather than the levels of pregnancy wastage or of fecundability."

Reports of lactation practices among Hutterite women are somewhat inconsistent, although there tends to be general agreement that almost all Hutterite women nursed their infants. On the one hand, Potter (1963:161) and Tietze (1957:92) claim that Hutterite mothers had weaned or partially weaned their infants by six months and Tietze contends that "breastfeeding beyond the first year of life is very uncommon." On the other hand, Sheps (1965-66:78) reports that "it is their custom to continue to nurse until another pregnancy supervenes."

Unfortunately, no such information on the lactation practices of Mormon women for this time frame is known. Although it perhaps may be safely assumed that Mormon mothers nursed their infants, the duration of the practice is unknown. However, with respect to the mean birth interval lengths discussed above, a case may be made for prolonged breastfeeding among Mormon women. Potter (1963-64:156), in estimating the mean birth interval when lactation was prolonged and contraception and pregnancy wastage were absent, found it to be 27 months.

Using this as a criterion, it could be conjectured that, although Hutterite women practiced breastfeeding, in view of the frontier conditions, Mormon women nursed their infants for a longer period. If these relative differences existed between Mormon and Hutterite lactation practices, however, they cannot be assessed. Nevertheless, it would not be implausible to suggest that differences in birth interval lengths between the two populations obtained from differences in duration of lactation.

4.4:3 Monogamous Mormons and Natural Fertility

Fertility differences between the monogamous Mormon and Hutterite populations were small. Moreover, Louis Henry (1961) has outlined the range of natural fertility as being over 50 per cent and the mean number of children ever born to women in continuous unions from age 20 as ranging from six to ten or more. The fertility of monogamous Mormons falls within the range suggested by Henry. Therefore, it can safely be stated that the monogamous Mormon population exhibited natural fertility.

4.5 The Effect of Husband-Wife Age Differences on Fertility

As was stated in Chapter 1, there are opposing viewpoints as to the effect disparate ages between husband and wife have on fertility. In their discussions on the effect of age differences on fertility in polygynous unions, Dorjahn (1958:855), on the one hand, claims that where a young female is married to a polygynous husband of "relatively advanced age" fertility will be depressed. In addition, he claims, that because of the shortage of younger women for spouses brought about by polygyny, younger monogamous males will marry older women. This situation, also, depresses fertility. Caldwell (1968), on the other hand, believes that age differences between spouses may act instead to maintain a higher fertility level.

Examination of age differentials between monogamous spouses and accompanying fertility levels is worthwhile as other intervening variables existent in polygynous unions are absent. For this analysis, age differences between husband and wife were broken into five-year intervals. Of the 749 monogamous women, 58.5 per cent were married to men who were up to 5 years (0 to 60 months) older than they, and 29.1 per cent were married to men from 5 to 10 years (61 to 120 months) older. Only 8.5 per cent had husbands who were between 10 and 15 years (121 to 180 months) older; and 2.7 per cent of the husbands were from 15 to 20 years (181 to 240 months) older. An extremely small percentage of the women were married to men who were more than 20 years their senior. In 0.8 per cent of the cases, the men were from 20 to 25 years (241 to 300 months) older; and, in another 0.4 per cent of the cases, they were from 25 to 30 years (301 to 360 months) older. None of these monogamous women was married to a man who was over 30 years her senior. Moreover, contrary to Dorjahn's assertions about a population in which polygyny is practiced, no continuously-married monogamous woman was married to a man younger than herself.

4.5:1 Fertility and Age Differences

Fertility differences, when related to age differences, reveal some interesting findings in the light of both Dorjahn's and Caldwell's contentions. As can be seen in Table 9, as age differences increased, fertility increased to a certain point and then began to decline. The pattern has an inverted U-form.

Table 9. Average Fertility, Birth Intervals, and Reproductive Span by Age Differences between Spouses for Monogamous Women Continuously Married through Age 46 by Age at Marriage

	Age Differences											
	0 to 5 Years				5 to 10 Years				10 to 15 Years			
Age	N	Mean Fertility	Mean Birth Interval (months)	Mean Reproductive Span (years)	N	Mean Fertility	Mean Birth Interval (months)	Mean Reproductive Span (years)	N	Mean Fertility	Mean Birth Interval (months)	Mean Reproductive Span (years)
-15	6	11.5	26.1	25.0	20	12.3	26.6	27.3	10	12.0	26.6	26.6
16	21	10.9	28.4	23.1	18	11.4	26.2	24.9	10	12.3	26.7	27.3
17	46	10.8	26.8	24.0	41	11.3	25.9	24.4	11	9.7	27.2	22.1
18	69	10.5	26.5	23.3	43	10.0	28.5	23.7	13	10.4	27.3	23.6
19	58	9.7	27.7	22.3	37	10.2	27.2	23.2	9	10.3	28.5	24.6
20	59	9.3	27.6	21.5	20	7.8	27.5	17.9	1	11.0	27.4	25.1
21	54	8.6	27.5	19.8	13	8.9	26.0	19.2	3	11.0	23.4	21.5
22	57	9.1	26.5	20.0	10	9.2	24.7	18.9	1	10.0	25.0	20.8
23	21	8.4	26.2	18.3	3	8.7	23.4	16.9	1	12.0	14.8	14.8
24	6	7.0	27.5	16.0	5	8.8	24.5	18.0				
25	12	8.2	26.2	17.9	4	7.0	30.3	17.7	2	5.5	31.2	14.3
26-29	18	7.6	25.2	16.0	2	6.5	33.1	17.9	2	7.5	20.5	12.8
30-33	8	5.3	29.1	12.7	2	3.5	24.6	7.2	1	2.0	19.0	3.2
34+	3	4.0	20.8	9.7								
Total	438	9.4	27.0	21.1	218	10.1	26.9	22.6	64	10.5	26.6	23.3

Table 9. (continued)

	Age Differences											
	15 to 20 Years				20 to 25 Years				25 to 30 Years			
Age	N	Mean Fertility	Mean Birth Interval (months)	Mean Reproductive Span (years)	N	Mean Fertility	Mean Birth Interval (months)	Mean Reproductive Span (years)	N	Mean Fertility	Mean Birth Interval (months)	Mean Reproductive Span (years)
-15	3	12.7	27.7	29.3	1	3.0	22.0	5.5				
16	1	9.0	27.6	20.7								
17	4	11.3	27.1	25.4	2	10.5	25.8	25.5				
18	3	11.0	26.4	24.2	1	12.0	24.1	24.1				
19	2	9.0	29.2	21.9	1	10.0	26.4	22.0				
20	2	29.1	21.8						1	5.0	15.6	6.5
21	1	9.0	31.8	23.8								
22	1	10.0	25.8	21.5								
23	3	8.0	23.9	16.0								
24					1	8.0	24.1	16.1				
25									2	6.0	25.2	12.6
26-29												
30-33												
34+												
Total	20	10.1	27.2	23.2	6	9.0	24.7	19.8	3	5.7	22.0	10.6

As age difference between husband and wife increased from 0 to 5 years to 5 to 10 years, mean fertility increased by almost one child, that is, mean fertility increased from 9.39 to 10.10, or a difference of 0.7 children. The marginal mean fertility, therefore, for a one year difference in husband-wife age differences is 0.14. The increase in the next category, where the husband was 10 to 15 years older, was less perceptible; and the mean fertility in this category was 10.50, the highest mean fertility level of any of the categories. The difference between the mean fertility levels in this category and the first, 0 to 5 years, was 1.11.

Although mean fertility began to decline with the next category, the decline was not at first significant. Where the wife was 15 to 20 years younger than the husband, the mean fertility was 10.05. However, as age differences increased from this point, mean fertility declined perceptibly. Where the age difference was 20 to 25 years, mean fertility declined to 9.00, a decline of 1.05 over the previous category, but only 0.39 lower than for women married within the same age cohort. A further decline in mean fertility of 3.33 occurred where the age differential increased to 25 to 30 years, the mean fertility level being 5.67 in this category. However, in these latter two difference-in-age categories, the numbers were too small to be indicative of real differences.

A disproportionate age distribution between difference-in-age categories existed. For women 0 to 5 years younger than their husbands, 6.2 per cent were married at age 16 or younger compared to 17.4 per cent for those 5 to 10 years their husbands' junior and 31.3

per cent and 20.0 per cent for those 10 to 15 years and 15 to 20 years younger than their husbands. These women, generally, had the highest fertility levels. Conversely, of women 0 to 5 years younger than their husbands, 9.4 per cent married at age 25 or later while 3.7 per cent of those 5 to 10 years younger and 7.8 per cent of those 10 to 15 years younger did so. No woman married to a husband 15 to 20 years her senior married at age 25 or later. As a result of the disproportionate age distributions at age of marriage and the generally declining fertility levels as age of marriage increased, only the fertility rates of women married during their most fecund years--ages 17 to 21--were calculated. Moreover, these women represented the majority of women in each age category. Of women 0 to 5 years younger than their spouses, they comprised 65.3 per cent, while they made up 70.6 per cent of those 5 to 10 years younger, 75.8 per cent of those 10 to 15 years younger, 60 per cent of those 15 to 20 years younger, and 66.7 per cent of those 20 to 25 years younger than their husbands.

In addition, standardization, using women 0 to 5 years younger than their husbands as the standard population, was employed to eliminate bias introduced by further age-compositional differences between categories within this group. Of women 0 to 5 years their husbands' junior, 16.1 per cent married at age 17 compared to 26.6 per cent of those 5 to 10 years younger, 29.7 per cent of those 10 to 15 years younger, and 33.3 per cent of those 15 to 20 years younger than their husbands. While 18.9 per cent of those 0 to 5 years younger than their husbands married at age 21, this was true for only somewhat greater than 8.0 per cent of those in the other categories.

Standardization revealed some slight changes. The mean fertility of women 0 to 5 years younger than their husbands increased to 9.78 and that for women 5 to 10 years younger than their spouses decreased to 9.59. However, where the age gap was 10 to 15 years, mean fertility remained the same while it decreased somewhat to 9.89 for women 15 to 20 years their husbands' juniors. Although fertility differentials were not great, there was a difference of 0.91 between women 5 to 10 years younger compared to those 10 to 15 years younger than their husbands.

Along with shifts in mean fertility, there were also shifts in ranking. With standardization of women 17 to 21 years of age at time of marriage, wives 0 to 5 years their husbands' juniors had higher fertility than women 5 to 10 years younger than their spouses; however, this difference was insignificant and the fertility of these two categories was virtually the same. The fertility of women 10 to 15 years younger than their husbands remained highest, and women 15 to 20 years younger had a fertility level higher than for both those 0 to 5 years and 5 to 10 years younger than their husbands, by 0.11 and 0.30 respectively. Essentially, then, up through difference-in-age category 15 to 20 years, fertility differentials were fairly insignificant and nowhere were they equal to or greater than 1.0 when standardization was employed. It was not until difference-in-age category 20 to 25 years that differences as great appeared, and, in these two later categories, the numbers were too small to justify standardization for comparative purposes.

It would appear, then, that the greater age of the husband, per se, relative to the wife is not a factor in depressing fertility, at least in this monogamous population. However, the numbers of those women marrying men twenty years or more older than they are too small to be significant in indicating the effects of the husband's advanced years on fertility.

4.5:2 Mean Birth Intervals

As it is highly probable that differential birth intervals will contribute to differential mean fertility rates, it is to be expected that mean birth intervals by age of marriage for each of the difference-in-age categories would be fairly similar for those up to 20 years and less younger than their husbands.

When mean birth intervals were computed for each age of marriage within each difference-in-age category, Table 10, little difference was found. Up through age 20, the difference between the extreme mean intervals was 3.1 months. After age 21, there was greater variability, particularly because some categories were quite small.

When the mean interval was calculated for each difference-in-age category, a difference of only slightly greater than two weeks was found between the categorical means up through difference-in-age category 15 to 20 years.

Table 10. Mean Birth Intervals by Age Differences between Spouses

	Age Differences											
	0-5 Years		5-10 Years		10-15 Years		15-20 Years		20-25 Years		25-30 Years	
Birth Interval	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
1	438	14.12	218	13.13	64	15.34	20	16.45	6	13.17	3	10.67
2	438	25.29	218	23.71	64	22.64	20	23.25	6	23.50	3	19.00
3	437	25.86	218	25.61	63	24.98	20	24.80	6	27.33	3	18.67
4	434	27.92	210	26.04	63	26.98	20	26.30	5	21.00	3	32.67
5	423	28.62	208	28.82	63	27.17	20	25.80	5	28.80	3	20.67
6	408	29.49	203	28.36	59	27.49	19	27.89	5	27.60	1	34.00
7	384	30.06	192	28.83	58	28.57	19	26.79	5	26.20	1	41.00
8	351	30.74	182	29.35	56	32.27	19	34.05	5	26.40		
9	301	31.82	158	28.06	52	28.83	17	34.18	4	25.75		
10	222	30.69	137	31.55	47	29.66	12	29.00	4	28.75		
11	153	30.58	103	30.29	36	28.92	7	32.86	2	31.50		
12	67	33.51	70	32.59	21	29.14	4	43.00	1	41.00		
13	38	31.16	47	38.83	12	27.17	3	32.33				
14	10	25.30	19	30.47	8	29.13	1	32.00				
15	6	23.17	8	26.38	6	48.17						
16	3	35.00	6	27.50								
17			3	23.00								
18			2	28.50								
$\bar{X}$ Intergenetic Interval		30.51		28.18		27.82		28.45		25.09		22.35
$\bar{X}$ Births		9.39		10.10		10.50		10.05		9.00		5.67

4.5:2a Protogenetic Intervals. When examining the mean protogenetic intervals, it was found that there was no consistent pattern of increase and/or decrease in the length of these birth intervals relative to age differences between spouses or to the mean number of birth events.

Women who were less than 5 years younger than their husbands had a protogenetic birth interval which was longer by almost one month than the first interval for women who were 5 to 10 years younger. However, this initial interval was also shorter than that for women who were 10 to 20 years younger than their spouses. So that women who were up to 5 years younger than their husbands gave birth to their first child almost 10 weeks earlier after marriage than did women 15 to 20 years younger and a month later than women 10 to 15 years younger.

4.5:2b Intergenetic Intervals. Examination of mean intergenetic intervals by parity also revealed some interesting differences. For those whose spouses were up to 5 years older than they, the length of the mean intergenetic interval increased steadily with each parity, although not by a consistent amount, through the ninth parity. From the tenth parity through the sixteenth parity, there was no discernible pattern of increases and decreases. The same pattern held true for those whose husbands were between 10 to 15 years their seniors. However, in this instance, the constant increase between parities held only through the eighth parity after which no discernible pattern was found through the fifteenth parity.

For those women who were between 5 to 10 years and 15 to 20 years younger than their husbands, an increase in the length of each successive intergenetic interval occurred only through the fifth and fourth parities respectively before no discernible pattern occurred.

When examining the mean intergenetic intervals for all parities by each of these difference-in-age categories, it was found that, although the mean length of the birth interval did not increase relative to age differences between spouses, when the mean number of birth events were ranked, as the mean number of birth events increased the mean length of the intergenetic birth intervals decreased. So that, those women who had the lowest mean number of birth events had the longest mean intergenetic birth interval and those women who had the highest mean number of birth events had the shortest mean intergenetic interval, the difference being greater than 2.5 months.

Although the difference was not very great and would not be considered significant in terms of contemporary fertility rates in western, industrialized nations, when considering mean fertility and the length of the intergenetic intervals of this population, 2.5 months is more significant. For example, it would require two additional years for a woman in the first category (with the lowest mean number of birth events) to experience ten birth events than it would require a woman in the latter category (with the largest number of birth events), who, in the meantime, could have an additional birth.

So that, the average length of the intergenetic intervals alone could account for a difference as great as 1.0 in the mean number of birth events between two categories.

4.5:3 Reproductive Span

When reproductive span (time spent from marriage to the last birth) was considered, there was found to be a close relationship between it and mean fertility.

Those with the highest mean fertility also had the longest mean reproductive span. Reproductive span ranged from a mean of 23.3 years for those whose husbands were from 10 to 15 years older than they to a mean of 10.6 years for those whose husbands were from 25 to 30 years older.

4.5:4 Parity Progression Ratios

Although there were only slight differences in fertility up through difference-in-age category 15 to 20 years and although differences in mean intergenetic intervals alone could account for those differences in mean fertility between each category, parity progression ratios were computed. These were calculated on the basis of birth events for each of the four categories--0 to 5 years, 5 to 10 years, 10 to 15 years, and 15 to 20 years in age difference of husbands over wives, as can be seen in Table 11. Greater differences in age were excluded due to the small numbers involved in those categories. These ratios were then applied to populations of 1,000 for each category to determine the manner in which different family sizes

Table 11. Parity Progression Ratios by Age Differences between Spouses

	Age Differences			
Parity	0-5 Years	5-10 Years	10-15 Years	15-20 Years
0	1.000	1.000	1.000	1.000
1	1.000	1.000	1.000	1.000
2	1.000	1.000	1.000	1.000
3	.998	1.000	.984	1.000
4	.993	.963	1.000	1.000
5	.975	.991	1.000	1.000
6	.965	.976	.937	.950
7	.941	.946	.983	1.000
8	.914	.948	.966	1.000
9	.858	.868	.929	.895
10	.738	.867	.904	.706
11	.689	.752	.766	.583
12	.438	.680	.583	.571
13	.567	.671	.571	.750
14	.263	.404	.667	.333
15	.600	.421	.750	
16	.500	.750		
17		.500		
18		.667		

Table 12. Projected Frequency Distributions of Family Sizes for 1,000 Marriages for Each Category of Age Differences between Spouses

	Age Differences							
	0-5 Years		5-10 Years		10-15 Years		15-20 Years	
Family Size	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage
1								
2	2	0.20			16	1.60		
3	7	0.70	37	3.70				
4	25	3.38	9	4.57				
5	34	6.76	23	6.86	62	7.80	50	5.00
6	55	12.26	50	11.89	16	9.37		
7	75	19.81	46	16.47	31	12.45		
8	114	31.20	110	27.52	62	18.67	100	14.98
9	180	49.23	96	37.16	78	26.48	250	29.98
10	158	65.02	156	52.75	172	43.69	250	65.01
11	197	87.68	151	67.88	235	67.18	150	80.02
12	66	91.32	106	78.46	141	81.27	50	85.02
13	64	97.92	129	91.32	62	87.51	100	95.02
14	9	98.63	50	96.37	31	90.64	50	100.01
15	7	99.32	9	97.29	94	99.98		
16	7	100.01	14	98.67				
17			5	99.13				
18			9	100.05				
Total	1000		1000		1000		1000	

would have been distributed (Table 12), whether or not there were differences in child-spacing patterns, and whether or not these could have had an effect on mean fertility levels.

As can be seen in Table 10, the categories differ in terms of maximum parity achieved, and there appears to be little relationship between this and the mean number of birth events. The category with the lowest mean number of birth events (0 to 5 years age difference) had a parity range of from 1 to 16 births, and the category with the highest mean number of birth events (10 to 15 years age difference) had a parity range of from 1 to 15 births. The category with the second highest mean number of birth events (5 to 10 years age difference) had a parity range of from 1 to 18, and the next category (15 to 20 years age difference), whose mean number of birth events was but 0.05 lower than the previous category's, had a parity range of from 1 to 14.

From Table 12, it can be seen that, although a somewhat larger proportion of those in difference-in-age category 10 to 15 years having achieved second parity failed to go on to the next parity than was true for the other categories, through the fifth parity there was little difference between categories in terms of cumulative percentages of those who had completed their family size. When comparing the two extreme categories (in terms of mean number of birth events), that category with the highest mean also had a higher percentage of those who had completed childbearing at or before the fifth parity, 7.80 per cent, compared to that category with the lowest mean, 6.76 per cent.

However, with each successive parity after the fifth, a greater percentage of those in the category with the lowest mean number of birth events failed to go on to next parity. By the ninth parity, almost one-half in the 0-to-5 year category, 49.23 per cent, had completed childbearing compared to 26.48 per cent for the difference-in-age category with the highest fertility (10 to 15 years). By the twelfth parity, 91.3 per cent of the women in the former category failed to go on to the next parity compared to 81.27 per cent in the latter category. By the fourteenth parity, 98.63 per cent in the first category had ceased childbearing compared to 90.64 in the latter category. It was not until the fifteenth parity that the cumulative percentages were virtually equal for both categories; and in both somewhat over 99 per cent had ceased childbearing.

As a result, if one examines the differences between the mean number of birth events for those women whose husbands were from 0 to 5 years older than they compared to the higher number for women whose husbands were from 10 to 15 years their senior, these differences can be attributed to two phenomena: 1) the difference in mean intergenetic birth intervals and 2) the larger percentages of women who ceased childbearing earlier in the former category.

For both of the other two difference-in-age categories, 5 to 10 years and 15 to 20 years, the mean number of birth events was virtually identical, 10.10 and 10.05 respectively. However, as can be seen in Table 12, the pattern of family size distribution was quite different. In the former category, family size (measured by birth events) ranged from 3 children to 18 children and in the latter category from 5 children to 14 children.

Similar mean fertility was a consequence of different patterns of family size distribution. While 27.52 per cent of the women in the former category had completed their family size by the eighth parity, this was true for only 14.98 per cent in the latter category. However, by the eleventh parity, 67.88 per cent of women experiencing an age differential of 5 to 10 years failed to go on to twelfth parity compared to 80.02 per cent of women whose husbands were from 15 to 20 years older than they. By the fourteenth parity, all women in the latter category had completed their families compared to 96.37 per cent in the former category, where 100 per cent was not attained until the eighteenth parity.

Although the mean fertility for both groups was essentially identical, as were the mean intergenetic intervals, similar mean fertility was achieved through different patterns of completed family size distributions. In the former category (5 to 10 years age difference), women had both a greater number of smaller and larger completed families than in the latter category where completed family size concentrated around the mean.

4.5:5 The Effects of Extreme Age Differences between Husband and Wife on Fertility

The lower fertility of women whose husbands were 20 years or more older than they might be interpreted to be the result of this age differential. However, as can be seen in Table 9, the numbers in this category are quite small, and, as happens in such cases, the extremes affect the mean.

Of those six women married to men 20 to 25 years their senior, only one, married at age 15 or before, had a small family of 3 children. Another woman, married at age 24, had but 8 children. However, this was the mean number of children for other women married at age 24. Of the remainder, one woman, married at age 18, had 12 children, which was above the mean for all other categories married at this age. Another woman, married at age 17, had 11 children, a level consistent with that age group; and two others, one married at age 17 and one at age 19, had a total of 10 children each. Again this was consistent with the mean for those married at these ages.

Consequently, with the exception of one case, women married to men 20 to 25 years older than they had completed family sizes consistent with expectations. In the exceptional case, it is unlikely that the husband's "advanced" age alone would have affected fertility as he would have been between 35 and 40 years of age at the time of marriage.

Of the three women married to men 25 to 30 years older than they, one, married at age 20, had a total of 5 children, considerably lower than would be expected for someone marrying at that age. The other two, married at ages 26 to 29, had 5 and 7 children each, neither being inconsistent with expectations.

Thus, it appears that the mean fertility level for those women married to men 20 years or more their senior is not so much affected by age differentials or the advanced age of the husband as by numbers too small for meaningful statistical analysis.

4.5.6 Fertility of Women Married to Husbands of A Similar Age

An explanation as to why those women whose husbands were up to 5 years older than they would cease childbearing anywhere from 1.5 years to 2.3 years earlier than women whose husbands were from 5 to 20 years older than they is more difficult.

Although interference with conception was forbidden, voluntary abstinence was not. Perhaps Caldwell is correct in his assessment that when a couple is closer in age there is greater intimacy and, as a result, greater communication takes place of both an extensive and intensive nature. It may be that these couples mutually agreed, upon reaching a certain age or when a particular family size was attained, that childbearing should cease. It may also be that greater understanding between them led to a delay in successive pregnancies compared with couples where greater age differences existed.

Since women of the same age with husbands 10 to 20 years older than they were having larger families generally than women 0 to 5 years their husbands' juniors, it is safe to assume that the factor leading to smaller families and longer intergenetic intervals in this latter category was social and not biological, on either the male's or the female's part.

However, these being historical data, the underlying reason for the fertility difference between this category (where the wife is 0 to 5 years younger than the husband) and the others cannot be determined and can only be speculative.

4.6 Marriage Cohort and Fertility

Eaton and Mayer (1953) found in their study of Hutterite fertility that fertility increased with each successive marriage cohort. This increase was attributed to improved living conditions.

In order to examine cohort fertility for monogamous Mormon females, with a view to ascertaining whether or not a similar pattern obtained and to providing a standard against which polygynous marriage cohort fertility can be measured, year of marriage was divided into five mutually exclusive categories: previous to 1848, 1848 to 1857, 1858 to 1867, 1868 to 1877, and 1878 to 1885.

4.6:1 Total Number of Children Ever Born

In examining the mean total number of children ever born to women in these cohorts, it was found that as year of marriage increased, average fertility increased, albeit slowly, until it peaked in the 1858 to 1867 cohort, and then it began to decline (as may be seen in Table 13). From 1867, the mean total number of children ever born declined in each successive cohort thereafter. As a result, the mean total number of children ever born to women married between 1878 and 1885 was 1.06 lower than for women married between 1858 and 1867 and 0.99 lower than for women married in 1847 or earlier.

Table 13. Mean Number of Children Ever Born by Marriage Cohort for Monogamous Females Continuously Married through Age 46 by Age at Marriage

	Year of Marriage									
	To 1847		1848 to 1857		1858 to 1867		1868 to 1877		1878 to 1885	
Age of Marriage	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
15 or under	1	12.00	7	12.57	13	12.21	12	10.75	7	12.86
16	1	14.00	4	10.66	12	11.54	20	11.16	13	10.93
17			18	12.06	21	10.95	45	11.18	20	10.50
18	5	11.20	12	10.50	26	10.62	49	10.52	37	10.50
19	2	9.50	11	10.91	17	10.94	40	9.85	37	9.68
20	3	10.67	8	9.50	11	10.09	32	9.16	29	8.36
21			6	8.33	10	9.60	24	9.29	31	8.87
22	2	11.00	7	10.43	9	11.22	18	9.17	33	8.52
23			2	10.50	9	9.11	5	8.20	12	8.42
24	1	8.00	1	8.00	2	10.50	2	8.00	6	6.83
25	1	9.00	3	7.67	4	7.50	6	8.00	4	8.00
26-29	1	4.00	5	8.20	8	6.88	6	7.00	4	8.75
30-33			2	6.50	2	4.00	5	4.60	2	4.00
34 or over			1	6.00	1	5.00			1	3.00
Total	17	10.35	87	10.40	145	10.42	264	9.91	236	9.36
Standardized Mean				10.40		10.25		9.77		9.63

Although proportional age-distributional differences between marriage cohorts were not as great as were those found for difference-in-age categories, they still existed. An examination of age at first marriage by marriage cohort indicates a trend toward both fewer younger marriages and fewer marriages after age 25. (This trend excludes those married prior to 1847. Here numbers are insufficient to be meaningful. Moreover, these women were married prior to the westward migration.) This is particularly noticeable for the 1878 to 1885 cohort. While in the 1858 to 1867 cohort, 17.3 per cent married at age 16 or before, and while somewhat over 12 per cent of those marrying between 1848 and 1867 were of this age, this was true of 8.5 per cent of those marrying in 1878 or later. In addition, 47.1 per cent of the 1848 to 1857 marriage cohort and 44.1 per cent of the 1858 to 1867 marriage cohort married between the ages of 17 to 19 inclusive, while 50.8 per cent of the 1868 to 1877 marriage cohort did so. However, of those marrying in 1878 and later, 39.8 per cent married at these ages.

Moreover, it was found that the percentages of those marrying between ages 20 to 24 inclusive increased with each successive cohort. However, little difference was observed in the percentages of those marrying between 1848 and 1877, the percentages being 27.6 per cent, 28.3 per cent, and 30.7 per cent. However, 47.0 per cent of those marrying between 1878 and 1885 did so between these ages. By contrast, the percentages of those marrying after age 25 declined with each successive cohort. Between 1848 to 1857, 12.7 per cent of women married at age 25 or greater compared to 10.4 per cent in the 1858 to

Table 14. Age Distribution by Age at Marriage and Year of Marriage for Monogamous Females Continuously Married through Age 46

Age at Marriage	Year of Marriage To 1847 N	%	1848 to 1857 N	%	1858 to 1867 N	%	1868 to 1877 N	%	1878 to 1885 N	%
15 or under	1	5.88	7	8.05	13	8.97	12	4.55	7	2.97
16	1	5.88	4	4.60	12	8.28	20	7.58	13	5.51
17			18	20.69	21	14.48	45	17.05	20	8.47
18	5	29.41	12	13.79	26	17.93	49	18.56	37	15.68
19	2	11.76	11	12.64	17	11.72	40	15.15	37	15.68
20	3	17.65	8	9.20	11	7.59	32	12.12	29	12.29
21			6	6.90	10	6.90	24	9.09	31	13.14
22	2	11.76	7	8.05	9	6.21	18	6.82	33	13.98
23			2	2.30	9	6.21	5	1.89	12	5.08
24	1	5.88	1	1.15	2	1.38	2	0.76	6	2.54
25	1	5.88	3	3.45	4	2.76	6	2.27	4	1.69
26-29	1	5.88	5	5.75	8	5.52	6	2.27	4	1.69
30-33			2	2.30	2	1.38	5	1.89	2	0.85
34 or over			1	1.15	1	0.69			1	0.42
Total	17	99.98	87	100.02	145	100.02	264	100.00	236	99.99

1867 cohort, 6.4 per cent in the 1868 to 1877 cohort, and 4.7 per cent in the 1878 to 1885 cohort.

Due to existent age-compositional differences and the effect of age at marriage on fertility, that is, differing periods of time spent at risk, standardization, using the 1848 to 1857 marriage cohort as the standard population, was employed to reduce the attendant age-structure bias.

As a result of this standardization, the mean fertility for marriage cohorts 1858 to 1867 and 1868 to 1877 declined somewhat. However, the mean fertility for cohort 1878 to 1885 increased somewhat. Moreover, standardized rates indicate that mean fertility actually declined in each cohort after 1857 and that the decline in each successive cohort after 1867 was somewhat less than is indicated by the unstandardized rates. Furthermore, although a slight increase was found in the mean fertility between the 1868 to 1877 and 1878 to 1885 marriage cohorts, their fertility levels were virtually the same.

4.6:2 Total Number of Birth Events

When examining the mean number of birth events, thus excluding the effects of plural births on the previous means, the same phenomenon was witnessed, as Table 15 depicts. As year of marriage increased, the mean number of birth events per cohort increased very slightly --by less than 0.05--so that the mean number of birth events for women married between 1858 and 1867 was only 0.07 greater than for women married in 1847 or earlier. However, those women married between 1868 and 1877 experienced somewhat fewer birth events on the average than women married in the previous decade, showing a decline of 0.62 births. In view of the average family size, this is not a significant decline.

Those women married between 1878 and 1885 experienced a decline in mean birth events of 0.50 over the previous decade, so that those women married in this period had 1.12 fewer birth events, on the average, than women married between 1858 and 1867 and 1.05 fewer birth events than women married in 1847 or earlier. Again, in view of the average completed family size, this decline is not significant. It should be noted that this last interval--1878 to 1885--is two years smaller than the previous three intervals. Had it been extended an additional two years, in view of the trend, the differences very likely would have been greater.

4.6:3 Birth Intervals

When mean protogenetic birth intervals for each marriage cohort were compared, little difference was found. The mean for this first interval increased slightly in each successive marriage cohort, peaking in the 1858 to 1867 cohort, and then declined in each of the last two cohorts. However, there were only 1.5 months difference between the longest and shortest mean protogenetic intervals, not a significant difference.

Although the mean protogenetic interval increased in the first three successive cohorts and then decreased in the next two, no such pattern existed for the mean for all intergenetic intervals for each cohort, as Table 15 indicates. Even though the mean for all intergenetic intervals in the last two cohorts was greater than in the first

Table 15. Mean Birth Intervals by Marriage Cohort for Monogamous Females Continuously Married through Age 46

Birth Interval	Year of Marriage									
	To 1847		1848 to 1857		1858 to 1867		1868 to 1877		1878 to 1885	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
1	17	14.5	87	15.1	145	15.4	264	14.2	236	13.9
2	17	24.7	87	22.0	145	23.2	264	23.4	236	23.7
3	17	27.7	87	24.1	145	25.9	263	26.2	235	25.4
4	17	24.6	87	26.5	145	26.3	258	27.5	229	27.8
5	16	25.6	86	26.6	140	28.7	255	28.6	225	29.0
6	16	28.1	80	27.1	135	26.9	250	29.6	216	30.3
7	16	31.3	80	30.4	131	28.1	234	29.7	198	29.5
8	16	27.9	76	31.8	123	27.9	218	31.8	180	30.5
9	14	32.9	64	28.4	113	27.1	193	30.8	148	30.1
10	12	29.8	53	27.4	95	31.2	131	32.6	107	30.2
11	7	33.1	44	29.8	74	27.6	110	33.0	73	30.3
12	6	34.0	26	30.4	47	31.6	56	32.6	39	30.6
13	2	22.0	16	29.0	27	30.9	32	43.4	22	30.7
14			8	27.6	13	32.7	6	27.5	11	26.0
15			4	25.3	7	49.3	4	19.0	5	23.4
16			2	35.5	1	43.0	3	18.3	4	36.0
17			1	21.0			1	30.0	1	18.0
18			1	42.0			1	15.0		
$\bar{X}$ Births		10.18		10.22		10.25		9.63		9.13
$\bar{X}$ Intergenetic Interval		28.29		27.32		27.51		29.02		28.33
$\bar{X}$ Reproductive Span		22.84		22.25		22.49		22.06		20.35

three, the differences, again, were not significant. Again, the difference between the largest and smallest means was but 1.7 months.

4.6:4 Reproductive Span

As would be expected, that cohort with the smallest average number of birth events had the shortest reproductive span, by at least two years, when compared with the other cohorts. However, the cohort with the largest average number of birth events did not have the longest mean reproductive span. Nevertheless, it was approximately only four months shorter than the longest one. Consequently, there was little difference in the mean time spent in childbearing between cohorts.

4.6:5 Parity Progression Ratios

As differential birth intervals do not account for the differences in fertility between marriage cohorts, parity progression ratios were constructed and examined. It appears from these that differential fertility between marriage cohorts was, again, the consequence of larger proportions of women in the last two cohorts refraining from childbearing at earlier parities than was true for women in the three earlier marriage cohorts.

Although it is true that some women in the last two cohorts--1868 to 1877 and 1878 to 1885--had as many or more birth events as did women in the previous three cohorts, women in the last two marriage cohorts also had a larger number of small families than did women in the other cohorts, as can be seen in Tables 16 and 17.

Table 16. Parity Progression Ratios for Monogamous Women Continuously Married through Age 46 by Year of Marriage

	Year of Marriage				
Parity	To 1847	1848 to 1857	1858 to 1867	1868 to 1877	1878 to 1885
1	1.000	1.000	1.000	1.000	1.000
2	1.000	1.000	1.000	1.000	1.000
3	1.000	1.000	1.000	.996	.996
4	1.000	1.000	1.000	.981	.975
5	.941	.989	.966	.988	.983
6	1.000	.930	.964	.980	.960
7	1.000	1.000	.970	.936	.917
8	1.000	.950	.939	.932	.909
9	.875	.842	.919	.885	.822
10	.875	.828	.841	.679	.723
11	.583	.830	.779	.840	.589
12	.857	.591	.635	.509	.619
13	.333	.615	.575	.571	.560
14		.500	.482	.188	.500
15		.500	.539	.667	.455
16		.500	.143	.750	.800
17		.500		.333	.250
18		1.000		1.000	

Table 17. Projected Frequency Distributions of Family Size for 1,000 Population Per Marriage Cohort for Monogamous Women Continuously Married through Age 46

	Year of Marriage									
	To 1847		1848 to 1857		1858 to 1867		1868 to 1877		1878 to 1885	
Family Size	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage
1										
2							4	0.4	4	0.4
3							19	2.3	25	2.9
4	59	5.9	11	1.1	34	3.4	12	3.5	17	4.6
5			69	8.0	35	6.9	19	5.4	38	8.4
6					28	9.7	61	11.5	76	16.0
7			46	12.6	55	15.2	60	17.5	76	23.6
8	118	17.7	138	26.4	69	22.1	95	27.0	136	37.2
9	118	29.5	127	39.1	124	34.5	234	50.4	174	54.6
10	294	58.9	104	49.5	145	49.0	79	58.3	190	73.6
11	59	64.8	207	70.2	186	67.6	205	78.8	99	83.5
12	235	88.3	115	81.7	138	81.4	91	87.9	73	90.8
13	117	100.0	91	90.8	96	91.0	98	97.7	46	95.4
14			46	95.4	41	95.1	8	98.5	25	97.9
15			23	97.7	42	99.3	4	98.9	4	98.3
16			11	98.8	7	100.0	7	99.6	13	99.6
17									4	100.0
18			12	100.0			4	100.0		
Total	1000		1000		1000		1000		1000	

In applying parity progression ratios for each marriage cohort to hypothetical populations of 1,000, it is seen that no woman in the first three cohorts--up to 1867--would have experienced as few as three birth events while 2.3 per cent and 2.9 per cent of the women in the last two cohorts respectively would have experienced as few or fewer births. Moreover, using the standard population of 1,000, half or more of the women in the last two cohorts would have ceased childbearing at or prior to the ninth parity, which would not be true for the other three cohorts until either the tenth or eleventh parity.

Using the standard populations of 1,000 and comparing the cumulative percentages of women who ceased childbearing at each parity for the 1878 to 1885 marriage cohort--that one with the lowest mean number of births--with the 1848 to 1857 and 1858 to 1867 marriage cohorts--those with the highest mean number of births--striking differences are found (refer to Table 17). It is seen that at each parity from the second through the fifteenth a greater percentage of women in the 1878 to 1885 cohort failed to go on to next parity than was true for women in the two earlier cohorts.

Nevertheless, in the earlier parities, the differences between the cumulative percentages are small. For example, by the fifth parity, 8.4 per cent of the women in the 1878 to 1885 cohort had discontinued childbearing compared to 8.0 per cent and 9.9 per cent respectively for the 1848 to 1857 and the 1858 to 1867 cohorts. However, after this parity, the cumulative percentages increase much more rapidly in the 1878 to 1885 marriage cohort than in the other two.

Of the women in the 1878 to 1885 cohort, 23.6 per cent had ceased childbearing at or before the seventh parity compared to 12.6 per cent and 15.2 per cent of the women in the earlier two parities. By the ninth parity, 54.6 per cent of the women in the later parity had refrained from further childbearing compared to 39.1 per cent and 34.5 per cent of the women in the earlier parities; and, by the tenth parity, 73.6 per cent of the women in the later cohort had terminated childbearing compared to 49.5 per cent and 49.0 per cent of the women in the earlier marriage cohorts.

It is not until the fourteenth parity that the cumulative percentages again approximate each other as closely as they did in the earliest parities. By this parity, 97.9 per cent of the women in the latest cohort had completed their family size compared to 95.4 per cent and 95.1 per cent in the 1848 to 1857 and the 1858 and 1867 cohorts respectively.

When comparing the 1878 to 1885 marriage cohort with the cohort married prior to 1848, striking differences are again found, although it should be recognized that many fewer observations were made for the earliest cohort. To begin with, there is a narrower range of family sizes for women married before 1848. No woman in this earliest cohort had fewer than four children, compared to 2.9 per cent of the women in the latest cohort, and no woman had more than 13 children, compared to 4.6 per cent in the later cohort who did. Although 5.9 per cent of the women in the earlier cohort stopped bearing children at the fourth parity and no woman ceased childbearing prior to this parity, it was not until the eighth parity that any other woman in this earliest cohort failed to go on to the next parity. At the eighth parity, a total of 17.7 per cent of the women in the earlier cohort terminated childbearing compared to 37.2 per cent of the women in the 1878 to 1885 cohort.

Moreover, while 54.6 per cent of the women in the 1878 to 1885 cohort had discontinued childbearing at or before the ninth parity, this was true for only 29.5 per cent of those women married before 1848. In addition, by the time 58.9 per cent of those women married before 1848 had completed their family size, by the tenth parity, 73.6 per cent of those married after 1877 had.

4.6:6 An Explanation for The Decline in Cohort Fertility: Secularization

Whereas Hutterites were and are able to maintain some degree of physical, social, and cultural isolation from the host population, Mormons were not able to do so. According to O'Dea (1964) and Erickson (1922), as well as others, it was primarily the isolation which Mormons enjoyed for a period which permitted them to develop and to retain distinct religious beliefs and practices.

Although gentiles (non-Mormons) had resided in Salt Lake City, in particular, and the Utah Territory, in general, since the early days of settlement, Mormons tended, generally, to be the dominant population in areas settled by them. The completion of the transcontinental railroad at Promintory Point near Corrine, Utah, on June 25, 1869, ended the relative physical and social isolation Mormons had sought through westward migration, had achieved to some extent, and had attempted to maintain. The completion of the railroad meant a large influx of gentiles, stimulated in part by the lure of the prospect of mineral exploitation.

In Chapter 2, mention was made of the effects this gentile influx had in exacerbating the conflict between the United States government and the L.D.S. Church over the polygamy issue. This general influx may also have had a direct effect on monogamous fertility.

An interesting fact about declining average birth events and total family size is that the decline began with that cohort married in that decade in which the transcontinental railroad was completed. The decline, beginning with the 1868 to 1877 marriage cohort and continuing with the 1878 to 1885 marriage cohort, may simply be a reflection of secularization resulting from greater contacts with a gentile population and may, in fact, have signalled the beginning of the progressively declining, albeit slowly, fertility rates which followed.

That birth rates which followed were lower has been shown. For example, in 1937 Anderson reported that between 1905 and 1932 the average family size in a southern Utah community was 8.5 children. This family size is somewhat lower than that found for the 1878 to 1885 marriage cohort. Moreover, this community would be more immune to the influences of the gentile population than would the more urban centers.

This point of view, that secularization at least contributed to, if not accounted for, the fertility decline, is supported by Spicer and Gustavus' (1974) study of the fertility of three populations from 1920 to 1970: The Mormons, Utah residents, and the population of the United States.

They found that while Mormon fertility remained higher than the fertility for the other two populations throughout this period, "the very great similarity in the pattern of the birth rate . . . is rather striking" (p. 75). Moreover, they discovered that "the difference in the Mormon and the United States birth rates has been remarkably stable" (p. 75). So that, in spite of exhortations from the pulpit against fertility limitation, Mormon fertility rates, though consistently higher than those from the other two populations, have exhibited a parallel pattern of increases and decreases.

Since the church has never defined what is a required or desirable family size, the dictum to "multiply and replenish" remains unclear when translated into numbers. Spicer and Gustavus suggest that Mormon couples have translated this dictum into simply "'having more children than other people are having.'" They further suggest that "non-Mormon neighbors may serve as a reference group for Mormon couples in planning their fertility to exceed that of others" (p. 76).

I would suggest, therefore, that based on later findings the declining fertility levels experienced by the latter two marriage cohorts were, at least in part, a consequence of a beginning trend of declining fertility resulting from the effects of secularization brought about by greater contact with the host society.

To further support the contention that secularization was a factor in declining fertility was the accompanying trend toward concentration of age at marriage, a trend which may also be interpreted as a consequence of secularization. Of women who married prior to 1868, approximately 39 per cent were between the ages of 19 and 23 inclusive. However, this increased to 45.07 per cent in the 1868 to 1877 cohort and to 60.17 per cent in the 1878 to 1885 cohort (refer to Table 14). Concommitantly, there was a decline in the percentages of those marrying at ages 17 or before in the latter two cohorts. Excluding those married prior to 1848 because of the small numbers involved, of those marrying before 1868, approximately 32 per cent married at age 17 or before compared to a somewhat smaller proportion, 29.18 per cent, in the 1868 to 1877 cohort. However, in the 1878 to 1885 marriage cohort, only 16.95 per cent married at these young ages. Moreover, there was also a decline in the proportions marrying at older ages in the latter cohorts. Prior to 1868, somewhat over 11 per cent of women entered a first marriage after the age of 24. This declined to 6.43 per cent in the 1868 to 1877 marriage cohort, and declined further to 4.65 per cent in the 1878 to 1885 cohort.

Though less easy to demonstrate, it might also be suggested that a contributing factor to declining fertility was less commitment to high fertility on the part of the population. It has frequently been found that those born into a religious sect are not as strongly committed to its tenets as were the original converts. As it is likely that a greater percentage of those married in the two latter cohorts were second generation, and some third generation, Mormons rather than converts, as the majority of the first two cohorts would have been, it is possible that lower commitment could have led to lower fertility.

Moreover, the Mormon Church has no established procedure for punishing those who practiced, or appeared to practice, fertility limitation, relying instead on peer group pressur to maintain conformity. Consequently, no formal means were employed to prevent declining fertility.

It is probable that lack of explicit norms regarding fertility expectations, declining commitment to religious tenets, and exposure to secular values interacted to reduce fertility somewhat in the two latter cohorts.

CHAPTER 5

POLYGYNOUS FERTILITY

Comparison of monogamous Mormon fertility with the fertility of Hutterite women strongly indicates that monogamous Mormon women generally were not practicing fertility limitation. It can, therefore, be stated with some assurance that the nineteenth-century Mormon population was one in which natural fertility prevailed.

It has been suggested that those participating in polygynous marriages were more religious than those in monogamous unions (their reason for entering such unions in the first place) and were, therefore, more likely to adhere to ecclesiastical dictums, i.e., multiply and replenish the earth, proscriptions against purposive interference with conception, and so forth. While, on the one hand, it is questionable whether, in fact, polygynists were any more religious than monogamists; on the other, it is also most unlikely that polygynists were any less religious than monogamists and, therefore, any less likely to adhere to tenets of the faith. It can safely be assumed, then, that whatever differences eventuate between the fertility of monogamous and polygynous marriages are a consequence of the differences in marriage pattern rather than a result of contraceptive practices.

In this chapter, the fertility of polygynous women, in general, relative to monogamous spouses will be explored. Moreover, fertility differentials resulting from differences in age between spouses for polygynous wives and relative to monogamous wives will be examined.

As well, fertility differences between marriage cohorts for polygynous women and relative to monogamous marriage cohorts will also be analyzed.

5.1 Mean Fertility for All Polygynous Women

As is frequently the case in studies of this nature, the mean fertility for all polygynous and monogamous females was computed controlling for no variables. The resultant mean indicates that polygynous fertility was, indeed, somewhat depressed relative to monogamous fertility. Although somewhat lower, the mean fertility for all polygynous women was, however, still high, being 8.27, the average family size being only 1.15 lower than for the comparable monogamous population. The median family size was 8.53 and the mode was 10.00, with a standard deviation of 3.12 (refer to Table 18).

Before continuing further, it should be pointed out that, as with monogamous women, the high fertility of polygynous women was not a consequence of a few couples having extremely large numbers of children, as can be witnessed by examining the parity progression ratios, Table 26.

Upon examining the completed family sizes of women continuously married through age 46, it was found that only one woman had as many as 18 children, one of her confinements being the birth of twins. Although no monogamous family had but one child, 9 of the 683 polygynous families did. However, of these, 5 wives married at age 30 or over. In addition, another 10 families had only 2 children, of which, 7 wives married at age 26 and over.

Table 18. Frequency Distribution of Family Size for All Polygynous Women

Family Size	Absolute Frequency	Relative Frequency	Cumulative Frequency
1	20	2.1	2.1
2	19	2.0	4.1
3	33	3.4	7.5
4	46	4.8	12.2
5	74	7.7	19.9
6	96	10.0	29.9
7	94	9.8	39.6
8	97	10.1	49.7
9	115	11.9	61.6
10	120	12.4	74.1
11	102	10.6	84.6
12	74	7.7	92.3
13	46	4.8	97.1
14	17	1.8	98.9
15	7	0.7	99.6
16	3	0.3	99.9
17			
18	1	0.1	100.0
Total	964	100.0	

Mean: 8.271
Median: 8.526
Mode: 10.000
Variance: 9.753
Standard Deviation: 3.123

Discontinuity of unions had little effect on over-all fertility levels. When the 108 discontinuous polygynous unions were selected out and the fertility for all continuously married polygynous females computed, again controlling for no other variables, mean fertility declined by only 0.01. The mean fertility for all continuously married polygynous women was 8.26. Perhaps surprisingly, the mean fertility for all polygynous women in discontinuous unions was somewhat higher at 8.31. Selecting out discontinuous unions, therefore, did not affect the differences between the mean fertility of monogamous and polygynous continuous unions significantly.

5.2 Fertility of Discontinuous Unions

Before continuing the analysis of the fertility of continuously married women, the fertility of women in discontinuous unions should be examined, if only briefly.

As can be observed in Table 19, of those polygynous women married through age 40 and over, women in discontinuous unions had slightly higher fertility than those in continuous unions. However, the opposite held true for women married through ages 28 to 39; here continuously married women had higher fertility. The above was not consistent with fertility of monogamous women. In this latter situation, females in continuous unions had the higher fertility. Nonetheless, women in discontinuous monogamous marriages had fertility levels higher than women in discontinuous polygynous unions.

The high fertility for women in discontinous unions generally, and the higher fertility of monogamous women relative to polygynous

Table 19. Fertility of All Continuously and Discontinuously Married Polygynous Females by Age at Marriage and Duration of Marriage

		Age Through Which Married														
		Age 46 and Over			Age 40 to 45			Age 34 to 39			Age 28 to 33			Age 27 and Under		
Age	–	N	$\bar{X}$	σ^2	N	$\bar{X}$	σ^2	N	$\bar{X}$	σ^2	N	$\bar{X}$	σ^2	N	$\bar{X}$	σ^2
-15	C	31	11.45	2.37	7	9.29	1.48	3	10.00	0.82	3	7.00	2.16	3	3.00	1.63
	D	10	11.00	3.13	1	11.00	0.00									
16	C	57	10.53	2.59	10	8.80	2.40	6	8.00	1.53	3	6.00	0.82	2	1.50	0.50
	D	8	9.75	2.28	2	8.00	1.00	2	7.50	3.50						
17	C	73	9.77	2.60	9	10.56	1.34	6	5.50	1.34	6	5.50	1.38	1	5.00	0.00
	D	14	9.57	1.99	4	9.75	2.86	2	7.50	1.50						
18	C	92	9.46	2.83	11	8.00	2.37	6	7.17	1.77	1	8.00	0.00	5	2.60	1.02
	D	4	10.50	2.29	2	6.50	1.50									
19	C	92	9.11	2.58	7	10.86	1.64	6	5.50	2.14	5	4.60	0.49	1	2.00	0.00
	D	6	7.50	2.62	2	6.50	1.50	3	5.00	2.45	1	4.00	0.00			
20	C	66	9.41	2.74	6	6.33	1.89	7	6.29	2.12	2	5.50	0.50			
	D	9	7.89	1.79	1	11.00	0.00	1	7.00	0.00						
21	C	48	8.60	2.83	3	8.33	2.62	1	6.00	0.00	4	2.75	1.30			
	D	6	7.00	1.63	2	9.00	2.00	2	6.00	0.00						
22	C	46	9.24	2.40	8	7.62	2.50	5	5.00	1.41						
	D	8	8.50	1.73	2	8.00	1.00									
23	C	39	7.15	2.49	5	5.00	1.90	2	5.00	2.00	3	2.00	1.41			
	D	5	7.40	1.50	1	5.00	0.00									
24	C	29	7.03	2.17	4	7.00	1.22	3	5.67	0.94						
	D	2	7.00	4.00				1	2.00	0.00	1	3.00	0.00			
25	C	23	7.17	2.10												
	D	1	4.00	0.00												
26-29	C	49	6.47	2.08	9	5.67	1.41	2	4.50	0.50						
	D	4	8.75	1.09				1	3.00	0.00						
30-33	C	24	4.46	1.71	7	2.71	1.66									
	D															
34+	C	14	2.71	1.34	1	3.00	0.00									
Total	C	683	8.70		87	7.61		47	6.34		27	4.85		12	2.67	
	D	77	8.83		17	8.35		12	5.75		2	3.50				

women in discontinuous unions, is not necessarily surprising in view of Lauriat's (1969) and Thornton's (1978) findings. In the population under consideration, a higher percentage of marital dissolution was a consequence of divorce in polygynous marriages than was true for monogamous marriages. As Thornton and Lauriat discovered, prior to divorce marital discord depressed fertility. This perhaps explains, at least in part, the lower polygynous fertility relative to monogamous fertility. Moreover, the high level of fertility in discontinuous unions generally may again be partially explained by Thornton's finding that "remarriage is followed by increased childbearing" (p. 378). So that whatever fertility may have been lost due to discord in an earlier marriage was made up by increased childbearing in the later marriage.

Another factor contributing to high fertility in these discontinuous unions was the amount of time spent between marriages. It has been frequently hypothesized that fertility of women in discontinuous unions will be lower due to the amount of time spent between unions and, therefore, not at risk. In this population, marriage was highly encouraged and singleness was viewed as an abnormal state, resulting in little total time being spent between unions. The mean total number of years spent between all unions for all women in discontinuous marriages was 2.16 years, the median being 0.85 years, with a standard deviation of 3.16. In the majority of those cases where longer than average periods of total time were spent between unions, women were in more than two (three or four) discontinuous unions.

Since it may be unlikely that in most populations one-half of all women experiencing marital dissolution would remarry within ten months, the above findings may be peculiar to this population and may not obtain for other polygynous groups.

Due to the relatively small numbers of women married in discontinuous unions, only women in continuous unions will be considered throughout the remainder of this study.

5.3 Fertility for Those Married Twenty Years or More

As was done with monogamous unions, the mean fertility was computed for all women in continuous unions for at least 20 years, disregarding age at marriage.

It was discovered that the mean fertility of this group of 729 women was 8.89, somewhat depressed (by 0.98) when compared with the fertility of the monogamous counterpart. The median number of children born was 9.13, the mode was 10.00, and the standard deviation was 2.87.

5.3:1 Mean Birth Intervals

When examining the mean birth intervals for women monogamously and polygynously married for 20 years or more (Table 21), it was found that the mean protogenetic birth interval for monogamous women was significantly shorter, by 2.8 months, than the mean protogenetic interval for polygynously married women.

Table 20. Frequency Distribution of Family Size for Monogamous and Polygynous Women Continuously Married for 20 years and More

	Monogamous			Polygynous		
Family Size	Absolute Frequency	Relative Frequency	Cumulative Frequency	Absolute Frequency	Relative Frequency	Cumulative Frequency
1				7	1.0	1.0
2	2	0.2	0.2	7	1.0	1.9
3	11	1.3	1.6	16	2.2	4.1
4	13	1.6	3.2	22	3.0	7.1
5	23	2.8	6.0	36	4.9	12.1
6	34	4.2	10.1	68	9.3	21.4
7	50	6.1	16.3	70	9.6	31.0
8	92	11.2	27.5	77	10.6	41.6
9	116	14.2	41.7	97	13.3	54.9
10	130	15.9	57.6	104	14.3	69.1
11	145	17.7	75.3	90	12.3	81.5
12	82	10.0	85.3	67	9.2	90.7
13	68	8.3	93.6	43	5.9	96.6
14	25	3.1	96.7	16	2.2	98.8
15	16	2.0	98.7	6	0.8	99.6
16	8	1.0	99.6	2	0.3	99.9
17						
18	2	0.2	99.9	1	0.1	100.0
19						
20	1	0.1	100.0			
Total	818	100.0		729	100.0	
Mean		9.872			8.890	
Median		10.023			9.134	
Mode		11.000			10.000	
Variance		6.824			8.246	
Standard Deviation		2.612			2.872	

Table 21. Mean Birth Intervals for Monogamous and Polygynous Women Married Continuously for 20 Years or More

Birth Interval	Monogamous			Polygynous		
	N	$\bar{X}$	σ^2	N	$\bar{X}$	σ^2
1	818	14.63	9.89	729	17.44	12.58
2	818	23.39	7.81	722	25.46	12.80
3	816	25.73	8.74	715	28.36	15.44
4	804	27.07	9.49	698	28.71	13.07
5	792	28.42	11.50	676	28.85	11.93
6	767	29.04	11.72	637	29.89	13.42
7	731	29.59	13.12	562	30.56	12.27
8	679	30.44	14.20	496	30.22	12.22
9	583	30.25	12.80	417	30.53	12.78
10	458	30.62	12.86	313	30.94	12.70
11	321	30.21	11.82	207	29.54	12.93
12	179	31.31	13.82	124	30.02	11.84
13	102	34.15	39.76	56	31.25	11.72
14	40	28.48	11.07	19	26.32	11.03
15	21	31.71	21.93	9	21.44	5.64
16	9	30.00	12.58	2	25.00	18.39
17	3	23.00	6.25	1	30.00	0.00
18	3	19.67	20.40			
$\bar{X}$ Intergenetic Interval		29.14			29.04	

Moreover, when comparing the mean intergenetic intervals, it was discovered that those at second and third parity were also somewhat shorter for monogamous women. However, the mean intervals from this latter parity through the twelfth parity were quite similar for the two groups, and the intervals from the thirteenth parity on were shorter for polygynous women. As a result, means were computed for all intergenetic intervals for monogamous and polygynous women. These revealed virtually no difference between monogamous and polygynous birth intervals, the means being 29.14 months and 29.04 months respectively.

Since the differences in the length of birth intervals cannot portray the somewhat depressed fertility experienced by polygynous women, parity progression ratios (Table 22) were developed. From these ratios, frequency distributions of family size for populations of 1,000 (Table 23) were projected.

5.3:2 Parity Progression Ratios

Parity progression ratios and projected family size distributions reveal that the slightly higher fertility of monogamous wives obtained as a result of these women having both fewer small families and more larger families than did polygynous wives. Moreover, in addition to having a smaller proportion of small families, a greater proportion of monogamous women terminated childbearing at later parities and at lower rates than was true for polygynous women, of whom more terminated childbearing at earlier parities and at greater rates.

Table 22. Parity Progression Ratios for Monogamous and Polygynous Women Continuously Married for Twenty Years or More

Parity	Monogamous	Polygynous
0	1.000	1.000
1	1.000	.990
2	.997	.990
3	.985	.976
4	.985	.969
5	.968	.942
6	.953	.882
7	.929	.883
8	.859	.841
9	.786	.751
10	.701	.661
11	.558	.599
12	.570	.452
13	.392	.339
14	.525	.474
15	.429	.222
16	.333	.500
17	1.000	

Table 23. Projected Frequency Distributions of Family Sizes for 1,000 Monogamous and Polygynous Women Continuously Married for Twenty Years or More

Family Size	Monogamous		Polygynous	
	N	Cumulative Percentage	N	Cumulative Percentage
1			10	1.00
2	3	0.30	10	1.99
3	15	1.80	24	4.34
4	30	3.27	30	7.31
5	31	6.37	54	12.69
6	44	10.77	103	22.99
7	63	17.11	90	32.00
8	117	28.80	108	42.81
9	152	44.04	142	57.05
10	168	60.78	146	71.61
11	173	78.12	114	82.99
12	94	87.53	93	92.31
13	76	95.12	51	97.39
14	23	97.44	14	98.76
15	15	98.91	10	99.72
16	7	99.65	1	99.86
17			1	100.00
18	4	100.02		
Total	1000		1000	

For example, only 1.8 per cent of monogamous women had completed family sizes of two or three children (none having but one child) while 4.34 per cent of polygynous wives had completed families of less than four. Furthermore, by eighth parity, 28.80 per cent of monogamous women terminated or had already terminated childbearing compared to 42.81 per cent of polygynous wives.

5.4 Fertility of Continuously Married Polygynous Women

As age of marriage as well as duration of marriage is a significant variable affecting fertility, these were cross-tabulated for all continuously married women in order to determine what differences prevailed.

When controlling for age at marriage and age-through-which-married, anticipated differences appeared. As could be expected with decreased amounts of time spent at risk, as age at marriage increased, fertility decreased; and as age-through-which-one-was-married declined, fertility again decreased. However, in both instances, the rate of decrease was not consistent, as can be seen in Table 24.

Calculated means for each category reveal the same pattern. For those not married through the entire childbearing period (age 46) either because of death of the husband, death of the female, or divorce and failure to remarry, fertility was lower than for those married through age 46. Moreover, as age-through-which-married declined, mean fertility decreased by at least 1.09 between categories. As well, the amount of decrease between categories increased with each successive category, although not by a consistent amount, until there

Table 24. Mean Number of Children for Continuously Married Polygynous and Monogamous Females by Age at Marriage and Duration of Marriage

Age at Marriage		Age Through Which Married									
		46 or Over		40 to 45		34 to 39		28 to 33		27 or Under	
		N	$\overline{X}$	N	$\overline{X}$	N	$\overline{X}$	N	$\overline{X}$	N	$\overline{X}$
15 or Under	M	41	11.95	3	10.33	4	7.75	2	7.00	1	5.00
	P	31	11.45	7	9.29	3	10.00	3	7.00	3	3.00
16	M	50	11.22	1	11.00	6	10.17	3	7.00	3	4.00
	P	57	10.53	10	8.80	6	8.00	3	6.00	2	1.50
17	M	104	11.05	8	10.25	7	9.00	5	6.00	2	3.00
	P	73	9.77	9	10.56	6	5.50	6	5.50	1	5.00
18	M	129	10.56	16	9.62	8	8.38	6	5.00	3	2.00
	P	92	9.46	11	8.00	6	7.17	1	8.00	5	2.60
19	M	107	10.77	9	8.89	4	8.00	4	4.75	1	3.00
	P	92	9.11	7	10.86	6	5.50	5	4.60	1	2.00
20	M	82	9.10	11	8.73	2	8.00	4	4.00		
	P	66	9.41	6	6.33	7	6.29	2	5.50		
21	M	71	9.07	3	10.00	3	8.00	4	3.75		
	P	48	8.60	3	8.33	1	6.00	4	2.75		
22	M	69	9.30	5	8.00	2	5.50	4	3.25		
	P	46	9.24	8	7.62	5	5.00				
23	M	28	8.75	3	8.33	2	6.00	4	3.25		
	P	39	7.15	5	5.00	2	5.00	3	2.00		
24	M	12	7.83	2	6.00			2	2.00		
	P	29	7.03	4	7.00	3	5.67				
25	M	18	7.89	2	8.50						
	P	23	7.17								
26 to 29	M	24	7.38	3	8.00	3	3.00				
	P	49	6.47	9	5.67	2	4.50				
30 to 33	M	11	4.73	1	2.00						
	P	24	4.46	7	2.71						
34 or Over	M	3	4.67								
	P	14	2.71	1	3.00						
Total	M	749	9.97	67	9.06	41	7.95	38	4.61	10	3.20
	P	683	8.70	87	7.61	47	6.34	27	4.85	12	2.67
Standardized	M		9.97		9.22		7.86		4.83		3.01
	P		9.16		8.41		6.27		5.53		2.94

was a difference of 2.18 between the mean fertility of those married through age 27 and the preceding category, those married through ages 28 to 33.

Moreover, within each age-through-which-married category, as age at marriage increased, the level of fertility generally declined. As was found with monogamous fertility levels, as the age at marriage increased by one year fertility, generally, did not decline by one birth. For example, those marrying at ages 17 through 20 and at age 22 and remaining married through age 46 had virtually the same mean fertility levels, ranging from 9.24 to 9.77. Again, as with monogamous women and for those married through age 46, the greatest decline in fertility occurred for those married after age-category 26 to 29, most probably a result of having passed peak fecundability.

5.4:1 Polygynous Fertility Compared with Monogamous Fertility for All Continuously Married Wives

5.4:1a Mean Fertility. Controlling for age at marriage and duration of marriage, polygynous fertility is shown to have been slightly depressed at almost every age at and duration of marriage. Although polygynous fertility was higher in a few categories, the numbers in these categories are generally too small to be considered significant, the exception being for those married at age 20 and still married through age 46.

The average family size for all women polygynously married through age 46 was 8.70 compared to 9.97 for monogamously married women through age 46, a slightly greater, though insignificant increase between them (1.27 compared to 1.20), than was found when controlling for no variables or when selecting out discontinuous unions. Mean fertility was also higher for all monogamous women married through ages 40 to 45 and 35 to 39, the differences being approximately 1.5. Fertility was similar only for those women who were married through ages 28 to 33 and age 27 and was slightly higher for polygynous females in the former category.

5.4:1b Standardized Fertility Rates. As was discussed in Chapter 3, there were age structure differences in regard to first marriage between monogamous and polygynous women, polygynous women tending to marry at both younger and older ages than monogamously married women.

Since the age composition at marriage of the two samples was different, the general levels of fertility may have been affected. Consequently, standardization was employed to eliminate the effects of compositional differences on the fertility levels of the two samples. Monogamous women married through age 46 were used as the standard population.

When standardization was employed, fertility differences between polygynous and monogamous women were generally reduced somewhat, except for those women married through ages 28 to 33 inclusive. Here fertility differences increased by 0.46 in favour of polygynous wives (as can be seen in Table 24). For women married through ages 34 to 39, fertility differentials were reduced by only 0.02. However, in the three remaining categories, fertility differences were reduced from between 0.46 to 0.64. None of the changes which occurred, although generally reducing differences by approximately 0.50, can be considered to be significant.

As with discontinuous unions, the numbers of women who were married for less than their total fecund years, age 46, were relatively small. Consequently, only those wives who were continuously married through age 46 will be considered throughout the remainder of this study.

5.4:2 A Comparison of Mean Birth Intervals

5.4:2a Polygynous Mean Birth Intervals. Mean birth intervals were computed and examined to ascertain whether or not differential lengths contributed to fertility differentials.

Initially an examination of birth intervals by parity was made. It was discovered that within each parity as age at marriage increased there was no pattern of increase and/or decrease in the length of the birth interval, as can be observed in Table 25. Moreover, except in the case of the protogenetic interval, where a difference of 13.6 months was found, it was not until seventh parity that a difference as great as one year existed between the lengths of the longest and shortest intervals within each parity. Instead, within each parity from the second through the sixth, a difference of from between 5 to 6 months was found. However, from the sixth parity on, differences within each parity ranged from 9 months to 26 months. It seems then

Table 25. Mean Birth Intervals for Polygynous Women Always Married through Age 46 by Age at Marriage

Birth Interval	Age at Marriage														X̄ Intergenetic Interval
	-15	16	17	18	19	20	21	22	23	24	25	26-9	30-3	34+	
1	24.5	17.8	17.4	18.1	17.6	15.7	15.8	14.0	19.6	19.2	11.8	16.4	17.4	21.3	17.7
2	25.5	25.3	24.4	24.7	24.2	27.2	29.2	23.9	26.8	28.5	25.9	25.3	21.8	23.4	25.5
3	27.6	24.9	30.1	27.6	28.3	30.0	24.6	27.9	29.7	25.4	29.7	26.4	27.3	27.7	27.8
4	27.3	28.0	29.1	27.0	29.6	30.3	26.1	27.6	33.1	30.2	28.8	29.9	33.4	27.0	28.9
5	25.6	29.4	28.6	27.9	26.9	29.6	30.4	29.2	28.6	31.7	27.1	29.0	30.6	26.0	28.6
6	30.4	31.2	30.1	29.6	30.5	27.3	34.9	28.4	31.9	29.0	31.9	28.7	31.3		30.2
7	28.7	31.3	32.7	32.0	30.4	30.6	30.5	27.7	32.4	35.5	26.2	26.1	17.0		30.4
8	28.3	31.1	31.3	29.3	29.5	30.1	32.4	29.4	27.4	30.8	28.9	22.4	30.0		29.8
9	26.5	29.7	33.7	30.4	34.8	27.8	28.3	29.6	27.2	32.8	38.2	31.0	46.0		30.8
10	29.6	33.4	31.5	30.9	30.9	31.1	31.7	30.4	25.2	36.5	30.3	24.0			31.1
11	27.0	28.2	27.6	31.2	34.6	27.6	27.0	21.6	27.3	35.0	21.0	18.0			29.0
12	27.9	33.7	32.9	30.9	30.5	28.8	21.3	19.8	38.0		41.0				30.5
13	33.8	28.4	35.9	29.8	27.2	32.0	35.0	28.5							31.2
14	31.2	31.5	15.7	31.0	26.0	23.0	12.0	25.0							26.5
15	19.0	21.0			28.0	27.0	20.0								21.4
16		38.0					12.0								25.0
17							30.0								30.0
X̄ Intergenetic Interval	27.7	29.6	30.0	29.5	29.6	29.3	24.6	26.7	29.9	31.5	30.0	26.4	29.6	25.4	

that age at marriage, per se, was not a factor affecting the average length of birth intervals within parities in polygynous marriages generally.

In addition, the means of all intergenetic intervals by parity were examined, again revealing the same lack of pattern of increase and/or decrease in the length of the interval with increasing parity. Moreover, the differences between lengths by parity were never as great as one year.

By comparison, an examination of birth intervals within each age-at-marriage category revealed an overall tendency for the length of the birth interval to increase with parity. However, unpatterned increases as well as decreases in interval length occurred between successive parities. As well, it was discovered that there were greater differences in the length of birth intervals between parities within each age group than there were between age groups when controlling for parity.

Examination of the mean intergenetic intervals for each age-at-marriage category revealed the same lack of consistency. Moreover, the range of difference between the longest and shortest mean intergenetic interval by age at marriage was not quite 7 months.

5.4:2b Birth Intervals of Monogamous and Polygynous Wives. As significant differences in the mean lengths of birth intervals would contribute to fertility differences, mean birth intervals for monogamous and polygynous women were examined controlling for age at marriage and for parity.

A comparison of mean birth intervals between monogamous and polygynous women by age at marriage revealed that, with the exception of women married at ages 20 and 25, monogamous women had the shorter mean protogenetic intervals, the differences ranging from 0.7 months for those married at age 22 to 11.3 months for those married at age 34.

Perhaps surprisingly, the mean intergenetic birth intervals were more similar between the two populations than were the protogenetic intervals. Those age categories with the lower birth intervals were equally divided between monogamous and polygynous categories, as women married at age 25 experienced identical mean intergenetic interval lengths.

A further comparison of all mean birth intervals for polygynous and monogamous women by parity reveals that, except for the eighth, tenth, eleventh, and twelfth parities, monogamous women had the shorter mean birth intervals. However, the differences between these were not great. Where monogamous women had the shorter intervals, the greatest difference between was found at the protogenetic interval. However, this meant that monogamous women had their first child only 3.1 months earlier, on the average, than polygynous wives. Elsewhere, differences ranged from 0.2 months (at fifth parity) to 2.3 months (at second parity). Where polygynous intervals were shorter, the differences ranged from 0.6 months to 1.1 month.

As there was little if any difference between the mean birth interval lengths--either by age at marriage or by parity--of monogamous and polygynous wives, fertility differentials between the two groups could not have been a consequence of differential child spacing due to lower frequency of intercourse on the part of polygynous women, as is frequently hypothesized. This is not to say that polygynous wives did not experience lower coital rates than did monogamous wives, that is something which cannot be determined. It is only to say that, if polygynous women did indeed experience lower coital rates, these rates did not affect child spacing relative to their monogamous counterparts.

5.4:3 Parity Progression Ratios for Monogamous and Polygynous Women

As differences in lengths of birth intervals cannot account for the fertility differentials between monogamous and polygynous females, parity progression ratios were developed for both monogamous and polygynous women married through age 46 (Table 26). These ratios were then applied to populations of 1,000 to determine what the frequency distribution by family size would be if the populations were of equal size (Table 27).

When examining family-size differences using these parity progression ratios, it can be seen that not only did monogamous women have fewer small families but also a greater number of larger ones than did their polygynous counterparts. In addition, it was found that monogamous women ceased childbearing at later parities and at lower rates than did polygynous women.

From an examination of the projected frequency distribution, it can be seen that 5.89 per cent of polygynous women had three or fewer children compared to 2.00 per cent of monogamous wives. Moreover, by

Table 26. Parity Progression Ratios for Monogamous and Polygynous Women Married through Age 46

Parity	Monogamous	Polygynous
0	1.000	1.000
1	1.000	.987
2	.997	.985
3	.983	.968
4	.982	.956
5	.963	.937
6	.948	.878
7	.930	.879
8	.868	.838
9	.793	.758
10	.713	.677
11	.542	.623
12	.614	.445
13	.380	.340
14	.526	.500
15	.450	.222
16	.333	.500
17	.667	

Table 27. Projected Family Size Frequency Distributions for Monogamous and Polygynous Women Continuously Married through Age 46

Family Size	Monogamous		Polygynous	
	N	Cumulative Percentage	N	Cumulative Percentage
1			13	1.30
2	3	0.30	15	2.78
3	17	2.00	31	5.89
4	18	3.76	41	10.03
5	35	7.32	57	15.70
6	48	12.14	103	25.98
7	62	18.29	89	34.94
8	108	29.08	106	45.48
9	147	43.76	132	58.67
10	161	59.90	133	72.02
11	184	78.27	106	82.57
12	84	86.66	96	92.24
13	82	94.94	52	97.36
14	24	97.34	13	98.68
15	15	98.81	10	99.71
16	8	99.61	2	99.85
17	1	99.74	1	100.00
18	3	100.00		
Total	1000		1000	

sixth parity, over one-quarter of polygynous women completed or had completed their family size compared to 12.14 per cent of monogamous women; and, by or at ninth parity, almost 60 per cent of polygynous women terminated childbearing compared to 43.77 per cent of monogamous women who did not approach this same proportion until tenth parity. Moreover, it was not until eleventh parity that the proportions of monogamous and polygynous women completing childbearing approached each other, being 78.27 per cent and 83.57 per cent respectively.

It is apparent that the somewhat depressed fertility of all polygynous women continuously married through age 46 relative to their monogamous counterparts was not a consequence of differences in child spacing. This somewhat depressed fertility was a result, instead, of larger proportions of polygynous women ceasing childbearing at earlier parities and in larger proportions than was true for monogamous wives.

Although differences between the mean fertility of monogamous and polygynous wives were relatively small in terms of the prevailing completed family size, as were differences between mean birth intervals, polygynous fertility was examined by age differences between husband and wife. This was done in order to compare the effects of age differentials within the polygynous population and between it and its monogamous counterpart in order to determine whether or not the same phenomenon of little or no difference between would prevail or whether difference in age between spouses would have a greater or lesser effect on the fertility of polygynous women relative to their monogamous counterparts.

Moreover, from this point forward, mean fertility will be measured by mean birth events rather than mean number of children ever born in order to eliminate whatever differences might accrue due to multiple births. The effects of these would be particularly evident in categories with small numbers. The mean number of birth events for monogamous wives was 9.71.

5.5 The Effects of Husband-Wife Age Differences on Polygynous Fertility

As was pointed out in Chapter 1, Caldwell (1963-64), as well as others, indicates that in a society with a balanced sex ratio polygyny is facilitated by men marrying women younger than they.

Moreover, as was indicated earlier, in both Chapters 1 and 4, disagreement exists over the effects of this purported resultant age differential between spouses on the fertility of a population. Dorjahn (1958:855), on the one hand, believes that age differentials obtaining in a polygynous population are of two types, both depressing fertility. To begin with, he asserts that where young wives spend their most fecund years married to men of relatively advanced age their fertility will be depressed relative to their monogamous counterparts. Moreover, he claims that due to a shortage of young, eligible females, brought about by polygynous men marrying younger women, males desiring a monogamous marriage will be forced to select older women as spouses, thereby depressing the fertility of the population further. Caldwell, on the other hand, claims that greater age differentials between spouses will most likely result in increased fertility while similarity in age will depress it.

An examination of the distribution of polygynous females in relationship to the age differentials between themselves and their husbands is in order before examining the fertility differentials which may or may not result.

Again, as with the monogamous population, age differences were divided into five-year categories.

When examining the distribution of women by age differentials, it was found that 71.9 per cent of polygynous women were married to men who were more than five years (61 months or more) their senior. Only 28.1 per cent were married to men of the same age cohort (0 to 5 years older) compared to 58.5 per cent of monogamous wives. This supports Caldwell's contention that a larger proportion of polygynous wives is drawn from a population younger than the husband. Furthermore, of polygynous wives, 13.6 per cent were married to men at least 20 years (241 months) older than they while only 1.2 per cent of monogamous wives, by comparison, were married to men that much older (refer to Table 28).

Surprisingly, perhaps because of its failure to be discussed in the literature examined, polygynous women did marry men younger than they. The failure to discuss this with regard to other populations perhaps results from the fact that this phenomenon, older polygynous women marrying younger husbands, is peculiar to this population. This, however, is doubtful. Nevertheless, although no monogamous woman was married to a man younger than herself, as was postulated by

Table 28. Distribution of Polygynous and Monogamous Females by Age Differences between Husband and Wife

Age Differences	Polygynous N	Polygynous %	Monogamous N	Monogamous %
0-5 Yrs Older	192	28.1	438	58.5
5-10 Yrs Older	137	20.1	218	29.1
10-15 Yrs Older	108	15.8	64	8.5
15-20 Yrs Older	98	14.4	20	2.7
20-25 Yrs Older	58	8.5	6	0.8
25-30 Yrs Older	20	2.9	3	0.4
30+ Yrs Older	15	2.2		
0-5 Yrs Younger	45	6.6		
5-10 Yrs Younger	7	1.0		
10-15 Yrs Younger	3	0.4		
Total	683	100.0	749	100.0

Dorjahn, 8.0 per cent of polygynous women were. Of this small group, 81.8 per cent were married to men who were up to 5 years (1 to 60 months) younger than they, 12.7 per cent were married to men 5 to 10 years (61 to 120 months) younger, and 5.5 per cent had a husband, 10 to 15 years (121 to 180 months) younger.

It is worth noting that the majority of women marrying younger males married at age 24 or later. Although the number of cases is small, of those women marrying men 0 to 5 years younger than they, 49 per cent married at this age or older, as did all women marrying men over 5 years (61 months) their junior. Six of the seven women marrying males 5 to 10 years younger than they married at age 26 or older; and all women marrying men 10 to 15 years younger married at ages 30 to 33.

In this population at least, polygynous rather than monogamous males sought spouses from among older women. Moreover, of the 38 women marrying at age 30 or later, only 14 married men up to 10 years their senior and 12 married men over 15 years their senior. Perhaps in this society where bearing children was highly valued, being childless was considered an abnormal state, and childless women were to be pitied, there was a selection factor at work on the part of older women who wanted to bear children (and not just on the part of younger males) and who, therefore, chose men or encouraged the selection of themselves by men whom they considered young enough to father and rear offspring. It is also probable that these women entered polygynous rather than monogamous unions due to a lack of eligible, single males, as more than 2.5 times as many women marrying at over age 30 entered polygynous unions as opposed to monogamous marriages.

As for the contention that age differentials will depress the fertility of a population because of the large proportion of young females married to men of advanced age, two age groups defined to be in their most fecund years were examined to determine the proportions married to men older than they. The two age groups considered were those married at age 16 or before and those married from age 17 through age 20.

Of these polygynous women in continuous unions through age 46, 88 were married at age 16 or earlier. Of these 53.4 per cent were married to men from 0 to 10 years their senior while another 22.7 per cent were married to men from 10 to 15 years their senior. In addition, only 10.2 per cent had husbands who were from 15 to 20 years older than they, and but 9.1 per cent were married to men 20 to 25 years older. Only 4.6 per cent were married to men 30 years or more older than they.

Of those 323 women married between ages 17 and 20, 49.5 per cent were married to men up to 10 years their senior and 3.1 per cent were married to men from 0 to 5 years their junior, so that 53.4 per cent were married within the same age cohort. Another 18.0 per cent were married to men from 10 to 15 years their senior while 14.9 per cent were married to men from 15 to 20 years older than they. Of these women, only 7.7 per cent had husbands who were from 20 to 25 years older, another 4.3 per cent were married to men from 25 to 30 years older, and no more than 2.5 per cent were married to men 30 years or more their senior.

If age 40 is defined as being "advanced" age for the husband at age of marriage, at the most only 13.6 per cent of those marrying at age 16 or before and 14.6 per cent of those marrying between ages 17 and 20 could have been married to men of advanced years. Even if the advanced age of the husband were to depress the fertility of individual females, it is doubtful that the small percentage of the total population which these females comprise would have significant effects on the fertility of that population.

5.5:1 Mean Fertility by Age Differences Between Spouses.

An examination of fertility levels by age differences between husband and wife and by each age at marriage of the wife showed that, generally speaking, as the gap between wives' and husbands' ages increased mean fertility declined. However, this did not occur consistently.

Furthermore, computation of mean fertility for each difference-in-age category revealed that in polygynous unions there was a more or less inverse relationship between differences in spouses' ages and fertility. Wives with the highest fertility were between 0 and 10 years younger than their husbands; after which, as age differences increased by five-year intervals mean fertility declined by approximately 0.5 births with each successive category. This occurred until the age gap reached 25 to 30 years at which point fertility declined by 1.2 births below the previous category. However, rather than continuing to decline, mean fertility increased by almost one birth in the next category, where the age gap was 30 years or more. Consequently, average fertility was from 1.6 to 2.8 lower for wives whose husbands were at least 20 years their senior compared to those who were their husbands' age cohorts.

Where the wife was the elder, the extent of fertility decline between categories as age differences between husband and wife increased was greater, as can be seen in Table 29. Moreover, the mean fertility levels of those who were older than their husbands were lower than for those who were up to 10 years younger than their husbands. It is to be expected that women 0 to 5 years older than their spouses would have had the same mean fertility as those up to five years younger, as both are essentially of the same age cohort as the husbands. However, where the wife was 0 to 5 years older, mean fertility was 1.2 lower than where the husband was 0 to 5 years older. Those women 5 to 10 and 10 to 15 years older than their husbands had even lower mean fertility levels relative to women 0 to 5 years younger than the husband, being 2.3 and 5.0 lower respectively.

Without further analysis, fertility differentials could be attributed solely to age differences between husband and wife. However, age of wife at marriage may be a more significant component than age of husband as it more directly affects fertility by determining period at risk. Upon examining the age composition of each difference-in-age category, it was found that in a large number of categories 20 per cent or more of the women married for the first time at age 25 or later. Although this high percentage did not obtain for all categories with lower fertility, it did for the majority. In those four categories with lowest fertility--where the husband was from 25 to 30 years older and those three categories where the wife was older--the percentage of women marrying at age 25 or older was 20.0 per cent, 37.8 per cent, 85.7 per cent, and 100 per cent respectively.

For example, although the mean fertility of women married to men 5 to 15 years younger than they was lower than the mean fertility of women married within their age cohort, the majority of these women married at an "advanced" age. Their mean fertility by age at marriage, however, was higher than the mean fertility for all polygynous women married at these same ages and was consistent with the mean fertility of women of these ages marrying within their age cohort.

Since the large percentage of women marrying at older ages affects the mean fertility for the total category, only the fertility rates of women married between ages 17 and 21 were computed and compared by age differences between spouses to determine the effects of these age differences on fertility. Furthermore, standardization was employed using monogamous women 0 to 5 years their husbands' juniors

Table 29. Mean Fertility, Birth Intervals, and Reproductive Span by Age Differences between Spouses for Polygynous Women Continuously Married through Age 46 by Age at Marriage (N=683)

	Age Differences															
	Husband 0-5 Years Older Than The Wife				Husband 5-10 Years Older Than The Wife				Husband 10-15 Years Older Than The Wife				Husband 15-20 Years Older Than The Wife			
Age	N	Mean Fertility	Mean Birth Interval (mo)	Mean Reproductive Span (yrs)	N	Mean Fertility	Mean Birth Interval (mo)	Mean Reproductive Span (yrs)	N	Mean Fertility	Mean Birth Interval (mo)	Mean Reproductive Span (yrs)	N	Mean Fertility	Mean Birth Interval (mo)	Mean Reproductive Span (yrs)
-15	2	9.5	27.8	22.0	12	12.6	25.6	26.8	7	11.6	26.4	25.4	6	11.3	28.9	27.3
16	14	11.3	26.8	25.2	19	11.1	27.6	25.4	13	10.1	28.6	24.0	3	8.3	29.6	20.5
17	17	10.7	27.2	24.2	14	10.4	27.7	24.1	19	9.2	29.7	22.7	10	10.2	29.0	24.7
18	32	10.0	25.8	21.4	13	10.5	28.0	24.4	16	8.5	31.0	21.9	18	9.1	27.0	20.5
19	28	9.6	28.1	22.5	22	9.2	27.4	20.9	17	9.8	26.2	21.4	10	7.3	30.6	18.6
20	21	9.3	28.0	21.8	13	9.2	29.9	22.8	6	10.0	26.4	22.0	10	8.9	26.7	19.8
21	17	8.9	26.7	20.0	8	8.6	27.6	19.8	6	7.2	29.1	17.4	8	8.6	27.4	19.7
22	16	9.4	25.1	19.7	7	7.9	28.0	18.3	5	6.6	29.8	16.4	7	10.0	25.4	14.0
23	13	8.1	28.3	19.1	6	6.5	28.7	15.6	2	9.5	23.9	18.9	6	5.3	28.3	12.6
24	8	7.9	27.4	18.0	4	5.8	29.5	14.2	4	6.5	27.9	15.1	2	7.5	29.2	18.3
25	4	7.0	28.0	16.4	6	5.7	29.2	13.8	3	10.0	23.8	19.9	3	7.3	26.3	16.1
26-29	12	7.2	25.8	15.4	7	5.7	27.1	12.9	4	6.3	22.3	11.6	11	5.8	25.4	13.4
30-33	4	5.3	22.9	10.0	4	4.3	25.9	8.2	4	2.5	22.2	4.6	2	2.5	25.8	5.4
34+	4	2.0	16.9	2.9	2	1.0	65.0	2.7	2	3.5	27.7	8.1	2	3.5	22.4	6.5
Total	192	9.2	26.8	20.5	137	9.1	27.7	20.9	108	8.7	27.9	20.3	98	8.2	27.6	18.9

Table 29. (continued)

	Age Differences															
	Husband 20-25 Years Older Than The Wife				Husband 25-30 Years Older Than The Wife				Husband 30 Years & Over Older Than The Wife				Husband 0-5 Years Younger Than The Wife			
Age	N	Mean Fertility	Mean Birth Interval (mo)	Mean Reproductive Span (yrs)	N	Mean Fertility	Mean Birth Interval (mo)	Mean Reproductive Span (yrs)	N	Mean Fertility	Mean Birth Interval (mo)	Mean Reproductive Span (yrs)	N	Mean Fertility	Mean Birth Interval (mo)	Mean Reproductive Span (yrs)
-15	4	8.5	36.1	25.5												
16	4	9.0	29.5	22.1					4	9.0	33.9	25.4				
17	8	7.8	29.8	19.2	2	8.0	27.9	18.6	2	5.0	33.1	13.8	1	9.0	33.3	25.0
18	10	8.5	29.1	20.6	1	2.0	22.5	3.8	1	7.0	34.1	19.9	1	9.0	30.0	22.5
19	4	7.8	31.4	20.3	8	6.3	31.7	16.5	1	9.0	26.1	19.6	2	11.5	25.9	24.8
20	3	9.3	27.5	21.4	3	9.7	28.1	22.6	4	6.5	33.5	18.2	6	11.3	23.6	22.3
21	7	7.9	27.5	18.1	1	7.0	25.7	15.0	1	6.0	42.3	21.2				
22	5	8.4	25.5	17.9									6	9.5	26.7	21.2
23	4	5.5	31.3	14.4					1	10.0	21.0	17.5	7	6.6	29.5	16.1
24	4	4.8	30.4	12.0	1	6.0	41.5	20.8					5	8.0	28.5	19.0
25					1	6.0	20.0	10.0					6	7.0	25.8	15.0
26-29	5	5.4	29.2	13.2	1	6.0	28.5	14.3	1	5.0	22.2	9.3	6	7.0	24.3	14.2
30-33					1	4.0	27.0	9.0					4	5.0	27.2	11.3
34+					1	2.0	14.5	2.4					1	5.0	23.6	9.8
Total	58	7.6	29.5	18.7	20	6.4	29.3	15.6	15	7.3	31.9	19.3	45	8.0	26.4	17.7

Table 29. (continued)

	Age Differences							
	Husband 5-10 Years Younger Than The Wife				Husband 10-15 Years Younger Than The Wife			
Age	N	Mean Fertility	Mean Birth Interval (mo)	Mean Reproductive Span (yrs)	N	Mean Fertility	Mean Birth Interval (mo)	Mean Reproductive Span (yrs)
-15								
16								
17								
18								
19								
20								
21								
22								
23								
24	1	11.0	23.1	21.2				
25								
26-29	2	7.0	24.1	14.0				
30-33	2	7.5	29.8	18.6	3	4.0	27.5	9.2
34+	2	4.0	20.1	6.7				
Total	7	6.9	25.0	14.3	3	4.0	27.5	9.2

as the standard population in order to eliminate the effects of age-compositional differences between the categories.

Standardization of fertility rates of this select group altered fertility in each category somewhat relative to the unstandardized rates for the total category. Generally speaking, mean fertility increased. However, where the wife was 25 to 30 years younger, rates remained unchanged, and, where the husband was 30 or more years older, rates declined by 0.51

Using standardized rates for women married at ages 17 through 21, it was found that only minor changes occurred (nothing as great as 0.25) in the differences between the mean fertility of those 0 to 5 years younger than their husbands relative to the mean fertility of the other difference-in-age categories up through the wives' being 20 to 25 years younger. In the majority of these categories, the differences between remained essentially unchanged. However, where the age difference was 25 to 30 years and 30 years and more, the differences between the mean fertility of these categories relative to the mean fertility of women 0 to 5 years younger increased so that women in these categories had 3.31 and 2.89 fewer children respectively than women who were their husbands' age cohorts, a 0.51 and 0.99 increase in fertility difference than was found for all women in these categories.

Moreover, when using standardized rates for women 17 to 21 years at age of marriage, fertility for women 0 to 5 years older than their husbands was 10.21 rather than 8.00 which was found for all women 0 to 5 years older using unstandardized rates. Consequently, these women had a mean fertility level 0.53 higher than women 0 to 5 years younger than their husbands, virtually the same fertility levels, as would be expected where women were married within essentially the same age cohort.

Even with standardization of fertility levels for women married at ages 17 through 21, women 25 to 30 years younger than their spouses still had fertility levels lower than women 30 years or more younger. However, the differences were not as great as with unstandardized rates for the entire categories.

It appears, then, that in polygynous unions age differentials, where the husband was the elder, depressed fertility. Fertility was depressed somewhat where the husband was from 10 to 15 years older than the wife (relative to their being of the same age cohort) and continued to decline by from 3 per cent to 4 per cent with each successive difference-in-age category until the age gap reached 25 to 30 years, at which point fertility declined sharply. Even though fertility increased in the next category, where the husband was 30 years or more older, fertility was still 2.7 lower here than where women married men of the same age cohort. It is possible that this is a spurious relationship and that other uncontrolled for variables contributed to this difference rather than differences in age per se. However, this is yet to be determined.

5.5:2 Mean Birth Intervals by Age Differences between Spouses

Due to resultant fertility differentials by differences in ages between spouses, mean birth intervals were examined to determine if differential birth interval lengths contributed. (Those two categories in which wives were 5 to 10 and 10 to 15 years older were excluded.)

5.5:2a Protogenetic Intervals. Examination of mean protogenetic birth intervals for each category showed that as the age gap between spouses increased the mean protogenetic interval increased somewhat. However, at difference-in-age category 25 to 30 years, it declined and remained virtually constant into the next category.

Women married to men 0 to 5 years their junior had the shortest mean protogenetic interval, 14.04 months, while the longest mean interval length, 20.07 months, was experienced by women married to men 20 to 25 years older than they. Consequently, the range of differences between the extreme protogenetic interval lengths was not considerable, being but 6.03 months.

5.5:2b Intergenetic Intervals. Referring to Table 30, it can be seen that the length of the mean intergenetic intervals by parity across age-differential categories generally increased as the age gap increased. Again, this was irregular. Moreover, in examining the length of intergenetic intervals within categories, the intervals tended to increase with earlier parities and then decreased with later parities, as would be expected. Again, this was not a constant pattern.

Table 30. Mean Birth Intervals by Age Differences between Polygynous Spouses

	Age Differences									
	0-5 Years		5-10 Years		10-15 Years		15-20 Years		20-25 Years	
Birth Interval	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
1	192	15.21	137	16.27	108	19.65	98	19.77	58	20.07
2	188	24.77	133	24.21	107	27.10	98	25.17	57	27.81
3	187	26.40	133	26.77	103	28.08	95	28.21	57	32.44
4	184	29.14	131	28.13	100	28.42	90	29.47	52	29.02
5	181	27.69	125	32.90	98	27.36	85	28.98	49	29.53
6	173	29.09	119	30.01	92	29.17	79	30.54	44	29.86
7	158	29.97	108	31.83	83	29.69	64	30.36	41	32.56
8	145	27.73	95	31.02	77	30.58	57	30.81	31	34.16
9	121	29.40	85	31.20	67	33.42	44	31.25	24	31.25
10	100	31.16	66	33.23	47	31.15	36	27.14	13	33.08
11	66	29.71	48	30.48	31	25.39	29	26.86	8	38.88
12	40	31.38	31	31.16	17	29.24	20	29.60	5	31.40
13	16	30.38	17	27.82	7	37.14	8	33.75	2	41.50
14	3	13.00	9	31.78	3	24.67	2	27.50		
15	1	20.00	5	18.60	2	26.50				
16	1	12.00	1	38.00						
17	1	30.00								
$\bar{X}$ Intergenetic Interval		28.26		29.57		29.01		28.67		30.89
$\bar{X}$ Reproductive Span		20.46		21.25		20.30		18.88		18.67

Table 30. (continued)

	Age Differences									
Birth Interval	25-30 Years		30+ Years		-0-5 Years		-5-10 Years		-10-15 Years	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
1	20	18.15	15	18.73	45	14.04	7	15.71	3	26.67
2	20	25.40	14	30.00	45	24.49	7	21.86	3	21.67
3	18	31.11	14	38.50	45	25.13	7	22.86	3	25.00
4	17	29.41	14	29.71	45	29.47	7	27.43	3	36.67
5	16	37.25	12	34.92	43	27.30	5	27.00		
6	15	37.33	10	39.70	39	31.72	5	33.20		
7	10	31.50	8	40.38	29	29.59	4	18.50		
8	5	30.40	7	34.00	24	27.25	2	25.00		
9	3	34.33	6	28.50	20	34.90	2	33.00		
10	1	13.00	3	29.00	13	32.46	1	32.00		
11	1	35.00	2	26.50	6	23.50	1	35.00		
12	1	22.00	2	36.00	4	23.75				
13	1	23.00	2	28.50	1	33.00				
14					1	23.00				
15					1	27.00				
16										
17										
$\bar{X}$ Intergenetic Interval		31.36		33.96		29.50		25.93		27.78
$\bar{X}$ Reproductive Span		15.63		19.29		18.43		13.96		9.17

Computing the mean intergenetic intervals for all women in each difference-in-age category revealed that as the differences between ages increased the length of the mean intergenetic interval increased somewhat. Again, this was irregular. The mean interval length increased in difference-in-age category 5 to 10 years over the mean interval length in difference-in-age category 0 to 5 years and then declined somewhat where the age gap was 10 to 15 years and again where the age gap was 15 to 20 years. The mean interval length then increased again with each successive category thereafter through difference-in-age category 30 years or greater.

From difference-in-age category 0 to 5 years, where the wife was the elder, through difference-in-age category 15 to 20 years, where the husband was the elder, the mean intergenetic intervals were relatively similar, there being a maximum difference of only 1.31 months between them. However, as the age gap increased, the length of the mean intergenetic interval length at difference-in-age category 20 to 25 years was 30.89 months and increased to 33.96 months where the age gap was 30 years or more.

As a result, the difference between the shortest mean intergenetic interval, 28.26 months (where the age gap was 0 to 5 years and the husband was the elder), and the longest mean intergenetic interval, 33.96 months (where the age difference was 30 years or more) was but 5.7 months. Therefore, although differences in mean intergenetic interval lengths are not great, they could account for part of the fertility differential which existed. This is particularly true where the husband was at least 25 years older than the wife.

5.5:3 Parity Progression Ratios.

Although there was an overall general relationship between fertility and length of the mean birth intervals, a strong relationship did not exist between them, and mean birth intervals in themselves did not account wholly for the fertility differentials between difference-in-age categories.

It is of interest to note that as age difference between spouses increased by each five-year interval, parity range declined by one with each successive category until difference-in-age category 20 to 25 at which point it stabilized and stayed constant throughout the remainder. Therefore, keeping age-compositional differences in mind, parity progression ratios were calculated for each difference-in-age category (Table 31) and frequency distributions by family size for populations of 1,000 were projected (Table 32) in order to determine what, if any, differences obtained between categories in the proportions of women who ceased childbearing at each parity.

From an examination of these tables, it is obvious that those with the highest fertility had fewer small families than was true for those with low fertility. For example, of those women married to men 0 to 5 years their junior, 4.40 per cent terminated childbearing at fourth parity; none having families of a smaller size. However, the percentage of those terminating or having already ceased childbearing by fourth parity increased by between 1 and 3 per cent with each

Table 31. Parity Progression Ratios by Age Differences between Spouses

	Age Differences									
Parity	0-5 Years	5-10 Years	10-15 Years	15-20 Years	20-25 Years	25-30 Years	30+ Years	-0-5 Years	-5-10 Years	-10-15 Years
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	.979	.971	.991	1.000	.983	1.000	.933	1.000	1.000	1.000
2	.995	1.000	.963	.969	1.000	.900	1.000	1.000	1.000	1.000
3	.984	.985	.971	.947	.912	.944	1.000	1.000	1.000	1.000
4	.984	.954	.970	.944	.942	.941	.857	.956	.714	
5	.956	.952	.949	.929	.898	.938	.833	.907	1.000	
6	.913	.908	.902	.810	.932	.667	.800	.744	.800	
7	.918	.880	.928	.891	.756	.500	.875	.828	.500	
8	.835	.895	.870	.772	.774	.600	.857	.833	1.000	
9	.826	.777	.702	.818	.500	.333	.500	.650	.500	
10	.660	.727	.660	.806	.667	1.000	.667	.462	1.000	
11	.606	.646	.548	.690	.625	1.000	1.000	.667		
12	.400	.548	.412	.400	.400	1.000	1.000	.250		
13	.188	.529	.429	.250				1.000		
14	.333	.556	.667					1.000		
15	1.000	.200								
16	1.000									
17										
18										

Table 32. Frequency Distributions of Family Sizes for 1000 Families Per Difference-in-Age Categories

	Age Differences between Spouses									
	Husband 0-5 Years Older Than The Wife		Husband 5-10 Years Older Than The Wife		Husband 10-15 Years Older Than The Wife		Husband 15-20 Years Older Than The Wife		Husband 20-25 Years Older Than The Wife	
Size Family	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage
1	21	2.10	29	2.90	9	0.90			17	1.70
2	5	2.60			37	4.57	31	3.10		
3	15	4.15	15	4.36	27	7.33	51	8.24	86	10.35
4	16	5.68	44	8.76	28	10.11	52	13.37	52	15.55
5	41	9.83	43	13.14	46	14.70	61	19.52	87	24.16
6	79	17.68	80	21.13	84	23.06	153	34.81	51	29.32
7	67	24.43	95	30.59	55	28.60	71	41.92	173	46.57
8	125	36.90	73	37.88	93	37.88	133	55.16	120	58.65
9	110	47.88	138	51.73	185	56.39	81	63.32	207	79.33
10	177	65.60	132	64.91	148	71.22	71	70.44	69	86.22
11	136	79.15	124	77.33	130	84.23	92	79.60	52	91.39
12	125	91.66	101	87.42	93	93.50	122	91.84	52	96.56
13	67	98.43	59	93.35	37	97.21	62	97.96	34	100.01
14	11	99.48	30	96.30	9	98.14	20	100.00		
15			30	99.26	19	100.00				
16			7	100.00						
17	5	100.00								
Total	1000		1000		1000		1000		1000	

Table 32. (continued)

Size Family	Age Differences between Spouses									
	Husband 25-30 Years Older Than The Wife		Husband 30+ Years Older Than The Wife		Husband 0-5 Years Younger Than The Wife		Husband 5-10 Years Younger Than The Wife		Husband 10-15 Years Younger Than The Wife	
	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage
1			67	6.70						
2	10	10.00								
3	50	15.04								
4	51	20.05	133	20.04	44	4.40	286	28.60	1000	100.00
5	49	25.01	134	33.39	89	13.29				
6	250	49.98	133	46.71	222	35.49	143	42.88		
7	250	74.99	67	53.37	111	46.58	285	71.44		
8	100	84.99	66	60.04	89	55.50				
9	100	94.99	200	80.02	156	71.08	143	85.42		
10			67	86.67	155	86.64				
11					45	91.09	143	100.00		
12					67	97.77				
13	50	99.99	133	100.00						
14										
15					22	100.00				
16										
17										
Total	1000		1000		1000		1000		1000	

successive difference-in-age category. Moreover, of those 25 to 30 years and 30 years or more younger than their husbands, 20 per cent had no more than 4 children.

In addition, not only did those with lower fertility cease childbearing at earlier parities but also in greater proportions. The percentage of decrease tended to be considerably higher at each of the parities earlier than eighth for those with lower fertility than for those with the higher levels of fertility. Consequently, by eighth parity, of those with the highest fertility (those 0 to 5 years younger than their husbands), 36.9 per cent ceased or had ceased childbearing. As fertility declined slightly, the percentage of those ceasing or having ceased childbearing increased until average fertility reached 8.0, at which point 55 per cent had completed family sizes of eight or fewer children. However, as fertility declined to 6.7, the proportion failing to go on to ninth parity declined slightly to 46.6 per cent.

By striking contrast, of those with the lowest mean fertility, those 25 to 30 years younger than their husbands, 85 per cent had family sizes of eight or fewer children. In addition, although women married to men 30 years or more older than they had longer average intergenetic birth intervals than those married to men 25 to 30 years older than they, only 60 per cent ceased or had ceased childbearing at eighth parity. However, it should be pointed out again that a smaller percentage of this category married at age 25 or later than was true for those married to men between 25 and 30 years older than they.

In terms of polygynous unions, then, where the husband was considerably older than the wife, fertility tended to be depressed when compared to women married to men of their own age cohort. This occurred for two reasons: 1) the length of time between parities was greater for those women with older husbands; and 2) women with older husbands tended to cease childbearing at earlier parities than was true for women whose husbands were of the same age cohort.

The depressed fertility of women married to men considerably younger than they was not a function of age differences between spouses but of the advanced age at marriage of the female and the consequent termination of childbearing at earlier parities. Moreover, the numbers in these categories were small and, therefore, cannot be considered to be relevant but only indicative.

5.5:4 Differential Fertility between Monogamous and Polygynous Women by Age Differences between Spouses.

A comparison of the effects of age differences on fertility between monogamously and polygynously married females is limited by the fact that polygynous marriage patterns based on age differences between spouses were more complex than were monogamous marriage patterns. This difference was due to the fact that very few monogamous women married men 15 years or more their senior and no monogamous woman married a man even slightly younger than herself.

5.5:4a Mean Fertility. Upon first analysis of the mean fertility for the difference-in-age categories for monogamous and polygynous women, it appears that for those women married within the same age cohort polygyny had no affect on fertility as the means were virtually the same--9.4 and 9.2--for both marriage patterns.

While in monogamous unions as the gap between husbands' and wives' ages increased fertility also increased somewhat, the opposite occurred in polygynous unions. As a result, as the age gap between spouses increased the differences in fertility between monogamous and polygynous women increased as well in each successive difference-in-age category until category 20 to 25 years' difference. At difference-in-age category 5 to 10 years, monogamous women had, on the average, one more child than polygynous women; at age category 10 to 15 years, monogamous women had a mean fertility level 1.8 higher; and by difference-in-age category 15 to 20 years, monogamous women averaged two more children. However, where the age gap was 20 to 25 years, mean fertility was, again, essentially the same. However, in these latter two difference-in-age categories, the numbers of monogamous women were small and the comparisons of fertility between the two marriage patterns may, therefore, not be meaningful.

In order to reduce age-compositional differences between the monogamous and polygynous populations, the means for women marrying between ages 17 and 21 only were computed. Moreover, standardized rates were calculated using as the standard population the monogamous population where the age differences were 0 to 5 years greater for the husband.

Table 33. Mean Fertility and Birth Intervals for Monogamous and Polygynous Women by Age Differences between Spouses

Monogamous Women

	Age Differences between Spouses														
	0-5 Years			5-10 Years			10-15 Years			15-20 Years			20-25 Years		
	N	Mean Fertility	Mean Birth Interval	N	Mean Fertility	Mean Birth Interval	N	Mean Fertility	Mean Birth Interval	N	Mean Fertility	Mean Birth Interval	N	Mean Fertility	Mean Birth Interval
Unstandardized	438	9.4	27.0	218	10.1	26.9	64	10.5	26.6	20	10.2	27.2	6	7.3	24.7
Standardized		9.8			9.6			10.5			9.9			10.9	

Polygynous Women

	Age Differences between Spouses														
	0-5 Years			5-10 Years			10-15 Years			15-20 Years			20-25 Years		
	N	Mean Fertility	Mean Birth Interval	N	Mean Fertility	Mean Birth Interval	N	Mean Fertility	Mean Birth Interval	N	Mean Fertility	Mean Birth Interval	N	Mean Fertility	Mean Birth Interval
Unstandardized	192	9.2	26.8	137	9.1	27.7	108	8.7	27.9	98	8.2	27.6	58	7.6	29.5
Standardized		9.7			9.6			8.9			8.8			8.3	

When standardized rates for this select group were compared, it was found that as age gap increased by five-year intervals for polygynous wives, fertility declined somewhat and for monogamous wives fertility increased and decreased erratically. However, except where the age gap was 20 to 25 years, the differences between monogamous and polygynous fertility by differences in spouses' ages were less. Not only did monogamous and polygynous women married to men of the same age cohort (plus or minus 0 to 5 years) have virtually the same fertility, but also did women married to men 5 to 10 years their senior. Of these, however, polygynous women married to men 0 to 5 years younger than themselves had somewhat higher fertility than the remainder.

Where the age gap was 10 to 15 years, monogamous women married between ages 17 and 21 had 1.56 more children than polygynous women, and where the age gap was 15 to 20 years, monogamous women had slightly greater than one child more than did their polygynous counterparts. Moreover, when using standardized rates for this select group, polygynous women married to men 20 to 25 years older than they had 2.63 fewer births on the average than monogamous women in this category; by contrast, when all women in this category were compared, using unstandardized rates, the difference between monogamous and polygynous fertility was 0.33 in favour of the latter.

5.5:4b Mean Birth Intervals. Examination of mean protogenetic birth intervals for each difference-in-age category showed that where women were married to men of the same age cohort the mean polygynous interval was two months longer than the mean monogamous interval.

From this initial category on, the difference between the mean protogenetic intervals increased by approximately 5 weeks in each of the next two categories and then declined by one month in the difference-in-age category 15 to 20 years.

Although it is to be expected that there would be greater differences existing between mean monogamous and polygynous intergenetic birth intervals, it was found that less difference existed between them than was discovered between the protogenetic intervals. Except for difference-in-age category 10 to 15 years, where polygynous women had a mean intergenetic interval slightly greater than one month longer than for their monogamous counterparts, the differences between were less than one month in the remaining categories.

Consequently, differential birth interval lengths did not contribute significantly, if at all, to differential fertility between comparable monogamous and polygynous categories.

5.5:5 The Effects of Age Differences between Spouses on Fertility.

Although no strong relationship was found between fertility and differences in age between spouses for monogamous women married between ages 17 and 21 and in continuous unions through age 46 and although no differences as great as 1.0 were found between the mean fertility rates of difference-in-age categories where the numbers were large enough to produce relevant means, this did not hold true for the comparable polygynous population. In this latter instance, there was an inverse relationship, generally, between age differences between spouses and fertility and the differences between means were as great as 3.8.

It is to be expected that if differences in age, per se, were a factor depressing fertility they would be operative in monogamous as well as in polygynous marriages. As this was not the case, it appears that in polygynous unions there were other factors peculiar to that marriage pattern, and perhaps related to differences in ages between spouses, operating to depress fertility. Moreover, as no monogamous women were married to men of truly advanced years at the time of marriage, as was true of polygynous women, comparisons in this area cannot be made nor inferences drawn about the effects of extreme age differences between spouses on fertility.

5.6 Fertility by Marriage Cohort

As differences in mean fertility were discovered between marriage cohorts among the monogamous population, marriage cohorts of polygynous women were examined to determine 1) whether or not the same pattern obtained and 2) whether or not differences existed between the fertility of monogamous and polygynous women within each marriage cohort.

For purposes of analysis, the polygynous population was divided into the same five marriage cohorts as was the monogamous population: prior to 1848, 1848 to 1857, 1858 to 1867, 1868 to 1877, and 1878 to 1885.

5.6:1 Mean Fertility.

An examination of mean cohort fertility indicated that differential fertility existed between women in the various cohorts, as can be observed in Table 34.

An analysis of mean fertility showed that, as with monogamous women, those women married before 1848 had slightly lower fertility (by 0.56) than those women married between 1848 and 1857. However, with each successive cohort after 1857, fertility declined so that the cohort married between 1878 and 1885 had a mean fertility 1.73 lower than for those women married between 1848 and 1857.

However, unlike monogamous women of whom a very low proportion marrying after 1878 were 25 years of age and older, approximately 23 per cent of polygynous women marrying in those years were of that age group. Consequently, in order to reduce the age-compositional differences affecting mean categorical fertility, rates for each marriage cohort were standardized using the 1848 to 1857 monogamous cohort as the standard population.

Using standardized rates, the mean fertility of all marriage cohorts increased somewhat, the greatest increases occurring for those in marriage cohorts 1858 to 1867 and 1878 to 1885. However, mean fertility for the 1868 to 1877 marriage cohort remained virtually the same, increasing by only 0.01.

While the differences in mean fertility between adjacent marriage cohorts using unstandardized rates approximated 0.50, greater variability between cohorts was introduced with standardization. Although fertility still declined with each successive cohort after

Table 34. Mean Number of Children by Marriage Cohort for Polygynous Females Continuously Married through Age 46 by Age at Marriage

	Year of Marriage									
	To 1847		1848-1857		1858-1867		1868-1877		1878-1885	
Age	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
-15	2	11.00	10	12.10	11	12.36	5	8.60	3	10.33
16	4	10.75	22	11.05	16	10.38	11	9.18	4	10.75
17	4	8.50	24	9.75	14	10.07	25	9.52	6	9.00
18	6	8.83	26	10.19	19	9.37	30	8.50	11	9.73
19	6	10.00	23	9.74	27	9.19	24	7.67	12	9.17
20	4	9.75	23	10.00	14	9.21	18	9.39	7	6.86
21	8	8.00	11	10.00	13	8.77	7	7.86	9	6.56
22	6	9.83	11	8.82	12	9.67	9	8.22	8	7.75
23	6	6.50	14	7.14	8	9.13	4	4.75	7	6.00
24	3	9.67	5	8.60	9	6.00	3	8.67	9	5.78
25	2	8.00	6	7.17	8	7.75	4	5.25	3	6.67
26-29	4	6.00	10	6.00	14	6.50	5	6.20	16	6.44
30-33	1	3.00	10	4.50	7	5.14	5	3.40	1	2.00
34+			3	3.33	6	2.00	2	3.50	3	3.00
Total	56	8.66	198	9.22	178	8.74	152	8.16	99	7.49
Standard-ized		9.14		9.46		9.32		8.17		8.28

1857, it increased slightly again with the 1878 to 1885 cohort. Moreover, although fertility declined between the 1848 to 1857 and the 1858 to 1867 cohorts, it was not by as much as 0.15, so actually remained constant. However, the decline between the 1858 to 1867 cohort and the 1868 to 1877 cohort was 1.15, at which point it stabilized in the next cohort. Therefore, in spite of slight fluctuations between cohorts, polygynous fertility was essentially stable until 1867, declined by somewhat over 1.0 in the 1868 to 1877 cohort, and restabilized at that level.

5.6:2 Mean Birth Intervals.

In spite of the fact that there was little difference between the mean fertility levels of marriage cohorts, the mean length of birth intervals were examined to determine whether or not there were any changes over time.

5.6:2a Protogenetic Intervals. An examination of protogenetic birth intervals by marriage cohorts indicated there was little difference between the mean lengths of these intervals, as can be seen in Table 35.

For those marrying between 1848 and 1857 and 1878 to 1885, the mean interval lengths were only 2.8 months and 1.6 months respectively shorter than for that cohort with the longest mean interval length, 18.9 months for those marrying between 1858 to 1867. For this latter cohort, the mean protogenetic interval length was but 2 to 3 weeks longer than for the remaining cohorts.

Table 35. Mean Birth Intervals by Marriage Cohort for Polygynous Females Continuously Married through Age 46

Birth Interval	Year of Marriage									
	To 1847		1848-1857		1858-1867		1868-1877		1878-1885	
	N	X̄	N	X̄	N	X̄	N	X̄	N	X̄
1	56	18.32	198	16.09	178	18.89	152	18.05	99	17.30
2	56	31.46	196	24.55	173	24.32	148	24.83	98	26.64
3	55	27.47	194	27.91	172	27.34	147	27.78	94	29.59
4	54	29.78	190	28.18	168	27.76	143	29.45	87	31.33
5	53	28.74	183	28.33	162	28.46	132	27.68	84	30.62
6	51	30.06	174	29.64	155	29.65	122	31.58	73	31.05
7	45	32.89	156	29.06	135	29.33	112	33.65	57	31.04
8	39	28.59	141	28.11	119	29.48	98	34.63	47	27.23
9	32	32.56	122	29.87	102	30.11	75	33.05	41	29.80
10	22	33.68	98	29.71	86	22.52	51	31.78	25	26.52
11	11	28.09	76	28.61	57	28.02	30	31.43	19	28.53
12	7	32.00	52	31.25	31	31.06	21	29.43	9	25.11
13	3	35.67	26	29.27	12	27.25	7	39.86	6	35.00
14	1	22.00	12	22.83	3	26.00	1	23.00	2	40.00
15			4	24.25	3	17.33	1	27.00	1	17.00
16			2	20.00						
17			1	30.00						
X̄ Intergenetic Interval		30.25		28.26		28.40		29.99		29.50
X̄ Reproductive Span		20.84		20.69		19.89		19.39		17.41

5.6:2b Intergenetic Intervals. It was found that even less difference existed between mean intergenetic intervals for each marriage cohort than existed between protogenetic intervals. The mean intervals ranged from 28.26 months to 30.25 months, the maximum difference between extremes being essentially two months.

Although the population having the highest fertility also had the shortest mean interval lengths, that population with the longest mean intergenetic interval length (those marrying prior to 1848) did not have the lowest fertility. However, the decrease and increase in standardized fertility rates after 1857 were accompanied by decreasing and increasing mean intergenetic interval lengths.

It is highly improbable, however, that the slight differences found between the mean intervals could have resulted in fertility differences as great as 1.0; although, it is plausible they could account for differences of 0.5 or less. As a result, parity progression ratios were calculated (Table 36) and frequency distributions of family size projected from these (Table 37) in order to determine if, as with other variables, differences obtaining in fertility were due, in part, to differential rates and parities at which childbearing was terminated.

5.6:3 Parity Progression Ratios.

Parity progression ratios and projected family size distributions by marriage cohort reveal that fertility differences resulted from several factors.

Table 36. Parity Progression Ratios by Marriage Cohorts for Polygynous Females Continuously Married through Age 46

	Year of Marriage				
Parity	To 1847	1848-1857	1858-1867	1868-1877	1878-1885
0	1.000	1.000	1.000	1.000	1.000
1	1.000	.990	.972	.974	.990
2	.982	.990	.994	.993	.959
3	.982	.979	.977	.973	.926
4	.982	.963	.964	.923	.966
5	.962	.951	.957	.924	.869
6	.882	.897	.871	.918	.781
7	.867	.904	.882	.875	.825
8	.821	.865	.857	.765	.872
9	.688	.803	.843	.680	.610
10	.500	.776	.663	.588	.760
11	.636	.684	.544	.700	.474
12	.429	.500	.387	.333	.667
13	.333	.462	.250	.143	.333
14		.333	1.000	1.000	.500
15		.500			
16		.500			

Table 37. Frequency Distributions of Family Size for 1000 Familes Per Marriage Cohort for Polygynous Women Continuously Married through Age 46

	Year of Marriage									
	To 1847		1848-1857		1858-1867		1868-1877		1878-1885	
Family Size	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage
1			10	1.00	28	2.80	26	2.60	10	1.00
2	18	1.80	10	1.99	6	3.38	7	3.28	41	5.06
3	18	3.57	20	4.05	22	5.60	26	5.89	70	12.09
4	17	5.31	36	7.60	34	9.00	72	13.14	30	15.08
5	36	8.91	45	12.13	39	12.91	66	19.74	111	26.20
6	108	19.65	91	21.18	112	24.14	66	26.32	162	42.36
7	106	30.34	75	28.75	90	33.09	92	35.53	100	52.45
8	125	42.81	97	38.37	96	42.66	152	50.67	61	58.54
9	179	60.65	121	50.51	90	51.66	158	66.45	162	74.72
10	196	80.32	111	61.61	163	67.95	138	80.27	61	80.79
11	72	87.48	121	73.74	146	82.56	59	86.19	101	90.90
12	71	94.63	132	86.87	107	93.25	92	95.40	30	93.93
13	36	98.21	70	93.94	50	98.31	39	99.34	4	97.98
14	18	100.00	41	97.99					10	98.99
15			10	99.00	17	100.00	7	100.00	10	100.00
16			5	99.50						
17			5	100.00						
Total	1,000		1,000		1,000		1,000		1,000	

To begin with, the range of completed family sizes (based on total birth events) varied somewhat by cohort. Those married between 1848 to 1857, and having the highest fertility, had completed family sizes ranging from 1 to 17 children. The range of family sizes for all later cohorts was from 1 to 15 children; and, for the earliest cohort, the range was from 2 to [illegible] children. This in itself, however, was not a signficant factor.

However, it was also seen that from the second through the eleventh parity the percentage of women who failed to go on to next parity increased with each successive cohort from 1848 to 1857. However, for those marrying between 1878 to 1885, the percentage which had terminated childbearing at twelfth parity forward tended to be lower than for those marrying between 1868 to 1877 and was more similar to those marrying in 1858 to 1867. Consequently, although there were larger numbers of small families in this cohort, 1878 to 1885, compared with the previous cohort, there were also somewhat more women having large families of 13, 14 and 15 children than was true for the earlier cohort.

For those women with the highest fertility, married between 1848 and 1857, not only did fewer have small families than was true for all later cohorts, but more also had larger families, contributed in part by the fact that some women in this cohort continued childbearing into later parities than occurred in the remainder of the cohorts.

Of women married up through 1847, none had but one child and a lower percentage, 19.65 per cent, failed to go on to next parity up through sixth parity than occur in any other cohort. At seventh parity, slightly more failed to have a next child than was true for women in the 1848 to 1857 cohort, and at eighth parity still more failed to go on to next parity than was true for either the 1848 to 1857 cohort or the 1858 to 1867 cohort, as can be seen in Table 37. At eleventh parity, the numbers terminating childbearing increased significantly over the previous parity, and all women had ceased childbearing at or by fourteenth parity.

Women in this initial cohort, then, had fewer small families (of six or fewer) than was true for any other cohort, and, although there were not as many very large families in this cohort relative to the remainder, women tended to concentrate their completed family sizes within a narrower range. As a result of this pattern of childbearing, women marrying before 1848 were able to maintain higher mean fertility than women in the last two cohorts and fertility levels quite similar to women in the two cohorts successive to themselves.

5.6:4 Polygynous Compared to Monogamous Marriage Cohorts.

5.6:4a Mean Fertility. Comparing the fertility of monogamously and polygynously married women by marriage cohort uncovers both similarities and differences between these two groups.

To begin with, using standardized fertility rates, fertility declined for both monogamous and polygynous women with each successive cohort after the 1848 to 1857 cohort to the 1868 to 1877 cohort. However, while fertility continued to decline somewhat for monogamous women into the 1878 to 1885 cohort, it increased somewhat for polygynous women.

Comparing the fertility differences between polygynous and monogamous women for each cohort, it is seen that in both the 1848 to 1857 and the 1858 to 1867 cohorts monogamous fertility was greater by approximately one child (0.94 and 0.93 respectively). Although both monogamous and polygynous fertility declined in the next cohort, rather than maintaining the same level of difference the gap between these increased, as the polygynous decrease was greater, so that polygynous women married between 1868 and 1877 had 1.60 fewer children. As monogamous fertility continued to decline somewhat and polygynous fertility increased somewhat in the 1878 to 1885 cohort, the gap between fertility levels decreased by a small degree so that monogamous women averaged 1.35 more children than did polygynous women.

5.6:4b Mean Birth Intervals. While the difference between mean protogenetic intervals in the 1848 to 1857 cohort was but one month longer for polygynously married women, it was approximately 3.5 months longer for polygynous women in each of the three later cohorts.

However, mean intergenetic interval differences between polygynous and monogamous spouses by marriage cohort were even less. In the cohorts between 1848 and 1877, mean polygynous intervals were less than one month longer than mean monogamous intergenetic intervals. In the 1878 to 1885 cohort, the mean birth interval for monogamous women was still less than 5 weeks shorter than for polygynous women.

Again, the differences between mean birth intervals could not have accounted for fertility differences as great as 1.00.

5.6:4c Parity Progression Ratios. Looking at frequency distributions of completed family size for populations of 1,000 projected from parity progression ratios (remembering that age compositional differences affect these), consistent differences were found within each cohort relative to polygynous and monogamous reproductive patterns.

Generally speaking, monogamous women had fewer small families, ceased childbearing at later parities, and continued childbearing into later parities than was true for polygynous women. For example, the proportion of monogamous women having completed families of fewer than four children was considerably lower than for polygynous women in each cohort. To illustrate, in the 1848 to 1857 and 1858 to 1867 cohorts, no monogamous women had fewer than 4 children compared to 4.05 per cent and 5.60 per cent respectively of polygynous wives; in the 1868 to 1877 cohort, 2.3 per cent of monogamous women had fewer than 4 children compared to 5.8 per cent of polygynous women; and in the 1878 to 1885 cohort, 2.90 per cent of monogamous women compared to 12.09 per cent of polygynous women had stopped childbearing prior to the fourth parity. Moreover, the percentages of monogamous women who had completed childbearing at that parity where 50 per cent of polygynous women had completed family size are significantly different in each cohort. In both the 1848 to 1857 and 1858 to 1867 cohorts, 50 per cent of polygynous wives had completed or completed childbearing at ninth parity compared to 39.1 per cent and 34.5 per cent of monogamous women respectively; in the 1868 to 1877 cohort, it was at eighth parity that 50 per cent of polygynous women compared to 27 per cent of monogamous women ceased or had ceased childbearing; and, in the 1878 to 1885 cohort, 52 per cent of polygynous women had completed childbearing at seventh parity compared to 26.60 per cent of monogamous women.

5.6:5 Possible Determinants Underlying Cohort Differences.

An examination of monogamous and polygynous fertility by marriage cohort indicated that, generally speaking, polygyny did depress fertility by at least one child.

As both monogamous and polygynous couples would have been exposed to the same external factors operating to depress fertility, it would be expected that as monogamous fertility declined with successive marriage cohorts polygynous fertility, if it declined at all, would decline at the same rate. However, in this population, polygynous fertility declined somewhat more rapidly than monogamous fertility. When monogamous fertility increased, polygynous fertility also increased but slightly.

The greatest difference between monogamous and polygynous fertility occurred for that cohort married between 1868 and 1877. One of the factors likely affecting the polygynous fertility of this cohort, and to a lesser extent, that cohort married between 1878 and 1885 was the prosecution by the federal government of polygynous males for illegal cohabitation.

As was discussed in Chapter 2, the passage of the Edmunds Act in 1882 led to an increase in prosecutions which became intensified in 1884 and continued unabated until the Manifesto abolishing polygyny in 1890. As was previously discussed, this intensification of federal activities frequently led to temporary separation of spouses not only through imprisonment of males but also as a result of avoidance tactics employed by polygynous couples in an attempt to escape detection and arrest.

Those marrying between 1868 and 1877 would have been married between 7 and 17 years when prosecution intensified. As was pointed out earlier, it is unknown how many of those included in this study were married to men who were imprisoned nor how old these women were at the time of the husband's imprisonment. Nor is it known how many of the women included in this study were secreted in out-of-the-way places, nor again, their ages at this period nor the length of separation.

If large numbers experienced lengthy periods of separation, it would be expected that not only would there be lower fertility rates but also significantly longer mean birth intervals. The latter, however, was not the case. However, in addition to temporary separation of spouses, for whatever reason, men were frequently released from prison with the condition that they not only not cohabit with the illegal spouse but that they also not enter onto her property. Violation of either condition meant further incarceration. Consequently, while many men ceased any type of contact with the polygynous wife, others also included the legal wife in the condition of exclusion. In other cases, the courts declared a younger wife (one with higher ordinal status) the legal wife. Some husbands, consequently, lived with them rather than with the older wife.

As a result of these different factors, some women were forced to terminate childbearing at earlier parities than normally would have been the case. Although cessation of childbearing at earlier parities by a larger proportion of the polygynous population was a general pattern in all cohorts, it was more pronounced in the 1868 to 1877 cohort.

Unfortunately, as a result of lack of adequate information for the population studied, the effects on the fertility of the population of various practices resulting from incarceration, threatened incarceration, or court decisions cannot be measured. However, if the social upheaval of this period acted to depress polygynous fertility, the 1868 to 1877 marriage cohort would have been more significantly affected than any of the others.

5.7 A Summary of Fertility of Monogamous and Polygynous Families

An initial analysis of monogamous and polygynous fertility indicates that polygyny depressed fertility somewhat.

A comparison of the fertility rates of all women married between 1840 and 1885 and continuously married through age 46 showed that fertility was depressed by approximately 1.0--by 1.27 when unstandardized rates were used and by 0.81 when standardized rates were used.

Further, fertility for polygnous and monogamous women by age differences between husband and wife and by marriage cohort were compared. All difference-in-age categories for polygynous women could not be compared with similar categories for monogamous women as they did not exist. However, where comparisons could be made, it was found that, while no difference in fertility existed between monogamous and polygynous women married to men of the same age cohort, greater age differences depressed polygynous fertility relative to monogamous fertility. When standardized rates were introduced, no differences appeared in the fertility of monogamous and polygynous women married to men up to 10 years their senior. However, where the age difference was between 10 and 15 years, fertility for polygynous women was depressed by approximately 1.0 relative to their monogamous counterparts.

Examination of monogamous and polygynous fertility by marriage cohorts again indicates that up through 1867 polygynous fertility was depressed by approximately 1.0. In the two later cohorts, fertility was depressed further. However, this may have been a result of additional social factors contingent on polygyny.

It has frequently been hypothesized that the lower fertility rates of polygynous women are a consequence of lower intercourse frequency. If this were the case for this population, there would have been significant differences between the lengths of monogamous and polygynous mean intergenetic birth intervals. Generally speaking, this was not the case.

In all three situations examined in this chapter, fertility differences between monogamous and polygynous women obtained not from differential birth interval lengths but generally due to cessation of childbearing at earlier parities and in greater proportions among polygynous than among monogamous women. It was found that monogamous women in all three situations have fewer small families and more larger families relative to their polygynous counterparts.

Although it was found that fertility of polygynous females in general tended to be depressed by approximately one child relative to the fertility of monogamous women, special conditions existing within polygynous unions which may operate to depress fertility further were not controlled for. These conditions include the number of wives present in the marriage, the ordinal status of the wife, and the percentage of fecund married years spent in a polygynous union, as well as separation of spouses through incarceration and/or avoidance tactics employed to avoid incarceration. So, at this point, it is unknown what effects these factors would have on polygynous fertility.

CHAPTER 6

SOME CHARACTERISTICS PECULIAR TO POLYGYNOUS MARRIAGE AND THEIR EFFECTS ON FERTILITY

In the previous chapter, it was found that the fertility of polygynous women, as a general category, was depressed somewhat relative to the fertility of monogamous women.

According to the polygyny hypothesis, polygynous fertility is depressed as a result of lower rates of coital frequency. In this chapter, three specific factors characteristic of all polygynous marriages which could conceivably diminish overall coital rates and thereby operate to depress fertility will be analysed. They will be examined to determine what, if any, fertility differences obtain within each and with respect to monogamous fertility. These three variables are: 1) the ordinal status of the wife, 2) the percentage of years spent in polygyny between age at marriage and age 46, and 3) the average number of wives present throughout a polygynous woman's married years through age 46.

6.1 Ordinal Status

In accordance with previous hypotheses, it is to be expected that the higher the ordinal status of the polygynous wife the lower will be her fertility. It is presumed that the greater the number of wives already in a union at the time of marriage with whom a husband's sexual favours must be shared the lower the coital frequency and, hence, the lower the fertility.

For purposes of analysis, ordinal status of the wife was divided into six categories: those women who were initially monogamous spouses and whose husbands married a polygynous spouse at some later date, those who were initially polygynous first wives, those who were second, third, or fourth wives, and, lastly, those wives who ranged from the fifth to the ninth in ordinal status. (No polygynous woman continuously married through age 46 had an ordinal status greater than nine.)

6.1:1 Mean Fertility and Ordinal Status

When controlling for age at marriage and ordinal status for all polygynous women continuously married through age 46, it was found, as had been hypothesized, that as ordinal status increased fertility generally decreased. First wives who were initially monogamous had higher fertility at almost all ages of marriage when compared with wives of higher ordinal statuses; and, excepting first wives who were initially polygynous, this phenomenon generally held for each ordinal status relative to those higher, as can be observed in Table 38. Furthermore, when comparing initially-monogamous first wives with always monogamous wives by age at marriage, the same fertility levels, essentially, prevailed. For six of the age categories, first wives had somewhat higher fertility, ranging from 0.10 to 0.94 births. In the other eight age categories, monogamous fertility was somewhat higher, ranging from 0.01 to 1.14 births.

Because of the small numbers obtained when cross tabulating age at marriage by ordinal status, particularly at the higher ordinal statuses, means for each ordinal status were calculated.

Table 38. Mean Fertility by Ordinal Status of Wife and Age at Marriage for Those Married through Age 46 (N=683)

	Status of Wife											
	First Wife Initially Monogamous		First Wife Initially Polygynous		Second Wife		Third Wife		Fourth Wife		Fifth or Greater Wife	
Age at Marriage	N	X̄	N	X̄	N	X̄	N	X̄	N	X̄	N	X̄
15 or Under	17	12.12			11	10.64	3	10.00				
16	37	10.92	1	7.00	16	10.25	2	7.50	1	6.00		
17	33	10.33	2	8.00	19	9.84	12	9.25	3	6.67	4	6.50
18	42	10.26	2	4.00	32	8.81	9	8.89	6	8.33	1	7.00
19	39	9.69	3	8.67	36	8.78	9	8.44	3	6.33	2	5.50
20	32	9.94			21	9.24	11	8.45	11	4.00	1	6.00
21	20	9.05			20	8.15	4	7.25	3	7.33	1	6.00
22	15	9.60			22	8.27	2	10.00	6	9.50	1	6.00
23	14	7.36	2	5.50	14	7.57	7	6.14	2	5.00		
24	14	7.93			11	6.36	2	5.50			2	5.50
25	10	7.60			9	6.44	2	8.00	2	6.00		
26 to 29	12	7.17			23	6.57	9	5.44	3	4.67	2	5.00
30 to 33	8	5.38	2	4.50	7	4.29	4	3.75	1	3.00	2	2.00
34 and Over	3	3.00			5	3.20	3	2.00	2	2.50	1	2.00
Total	296	9.56	12	6.42	246	8.28	79	7.52	33	6.73	17	5.24
Standardized		9.71		6.59		8.78		8.35		6.68		6.07

It was found that although there was little overall difference (0.15) between the mean fertility of initially-monogamous first wives and always monogamous women, there was a significant difference between the mean fertility levels of initially-monogamous and initially-polygynous first wives. Women who were initially in monogamous marriages and later became polygynous wives had on the average 3.14 more children than first wives who entered into polygynous unions upon marrying. In fact, initially-polygynous first wives had a mean fertility lower than the means for all higher ordinal statuses excepting fifth or greater. However, there were so few initially-polygynous first wives in the sample under consideration that the findings cannot be generalized to the population.

As ordinal status increased to second wife, mean fertility declined and did so with each successive status thereafter. As a result, the mean fertility of second wives was 1.28 lower than that of initially-monogamous first wives, while the mean fertility of third and fourth wives was 2.04 and 2.83 lower respectively. The mean fertility of wives whose ordinal status was five or greater was 4.32 lower than for initially-monogamous first wives; however, as the numbers in this ordinal-status category were, again, so small, the findings may not be significant.

In examining the proportion of those married at age 25 or later by ordinal status, it was found that as ordinal status increased the percentages in these age categories also increased. Of initially-monogamous first wives, 11.2 per cent married at age 25 or later compared to 17.9 per cent of second wives and 22.8 per cent of third wives. Of fourth wives, 24.2 per cent married at these advanced ages, and, by the fifth to the ninth ordinal status, 29.4 per cent married during these ages.

Because of the age-compositional differences between the ordinal statuses, standardization was employed using the monogamous population as the standard population.

When mean rates were standardized, fertility increased for all ordinal statuses except the fourth where it showed a decline. The use of standardized rates showed that initially-monogamous first wives and monogamous wives had the same average completed family sizes, 9.71. Comparing the mean fertility of all other ordinal statuses to that of initially-monogamous first wives, it was found that fertility differences between for second and third wives decreased to 0.93 and 1.36. However, fertility differences increased slightly for fourth wives to 3.03 and the differences in the general fertility levels for wives whose ordinal status was five or greater decreased to 3.64.

So, although standardization reduced differences somewhat between the mean fertility of initially-monogamous first wives and those wives of higher ordinal statuses, significant differences still existed for those whose ordinal status was fourth or greater.

6.1:2 Mean Birth Intervals and Ordinal Status

The mean birth intervals for each ordinal status were examined to determine whether or not significant differences existed between them.

6.1:2a Protogenetic Birth Intervals. Examination of mean protogenetic birth intervals revealed that, generally speaking, the length of the protogenetic birth interval increased as ordinal status increased. However, this did not hold true in each category. Women who were initially-polygynous first wives had the shortest mean protogenetic interval and wives who were the fifth through the ninth wife had a mean protogenetic birth interval two-and-one-half weeks, on the average, shorter than that for third wives. As a result of increasing interval length with successive ordinal status, a difference of 7.8 months existed between the longest and the shortest mean protogenetic birth intervals.

When comparing the mean protogenetic birth interval for always monogamous women with the mean protogenetic birth intervals for polygynous women by ordinal status, it was found that there was little difference between first wives. However, the differences between the monogamous mean protogenetic interval and the mean intervals of each consecutive ordinal status were greater with each successive ordinal status to the fifth or greater wife. So that, while second wives had their first child 3.9 months later than monogamous wives, third and fourth wives postponed first children for 6.2 and 7.9 months relative to monogamous women. By contrast, fifth to ninth wives had a mean protogenetic interval 5.6 months longer than did monogamous women.

6.1:2b Intergenetic Birth Intervals. Mean intergenetic birth intervals examined by parity revealed no pattern of increases or decreases from one ordinal status to the next. However, excepting initially-polygynous first wives, the mean intergenetic interval for each ordinal status increased successively, as can be observed in Table 39.

Comparison of mean intergenetic intervals for the higher ordinal statuses with the mean interval for initially-monogamous first wives disclosed there was virtually no difference between for second and third wives, these being between only one and two weeks longer, and but five weeks difference between for fourth wives. However, wives who were fifth to ninth wife spaced their children, on the average, 6.2 months further apart than did initially-monogamous first wives, and initially-polygynous first wives had a mean intergenetic birth interval 3.6 months longer than for those who were initially monogamous.

Comparing the mean intergenetic birth interval of monogamous wives with those of polygynous wives by ordinal status revealed less difference than was found between protogenetic intervals. Mean intergenetic intervals for initially-monogamous wives and second and third wives were essentially the same as for monogamous wives, and fourth wives had a mean interval only 1.5 months longer. However, initially-polygynous first wives and wives of fifth and greater ordinal status had mean intergenetic interval lengths which were 3.9 months and 6.4 months greater than the mean interval length for always monogamous spouses.

6.1:3 Parity Progression Ratios

As mean birth intervals are not significantly different until the higher ordinal statuses, parity progression ratios were constructed

Table 39. Mean Birth Intervals by Ordinal Status for Women Married through Age 46

Birth Interval	Ordinal Status of Wife											
	First Wife Initially Monogamous		First Wife Initially Polygynous		Second Wife		Third Wife		Fourth Wife		Fifth or Greater Wife	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
1	296	15.02	12	14.50	246	18.35	79	20.61	33	22.30	17	20.00
2	293	26.41	11	22.09	243	24.70	76	26.33	32	25.22	17	24.82
3	292	26.16	11	34.36	241	27.46	74	30.66	30	32.63	14	37.07
4	289	28.51	10	32.80	232	29.17	70	28.69	29	28.00	13	31.38
5	282	27.18	10	32.60	221	29.11	64	28.44	25	32.08	11	43.36
6	275	29.91	9	29.56	198	30.67	58	30.26	22	28.95	10	40.80
7	258	30.64	7	37.00	169	30.43	49	29.96	17	31.12	5	41.40
8	235	28.62	5	34.60	149	30.87	40	30.73	14	36.43	1	24.00
9	201	30.17	2	64.00	127	31.47	32	29.03	9	32.56	1	46.00
10	166	32.20			86	29.84	24	28.04	6	24.83		
11	115	29.70			56	27.63	17	26.59	4	37.75		
12	73	31.01			37	30.22	7	32.14	3	16.33		
13	34	30.09			17	32.53	3	36.00				
14	11	19.82			7	37.00						
15	6	20.50			3	23.33						
16	2	25.00										
17	1	30.00										
$\bar{X}$ Intergenetic Interval		28.71		32.32		28.95		29.06		29.94		34.88
$\bar{X}$ Reproductive Span		21.72		15.58		19.04		17.47		16.30		13.98

(Table 40) and frequency distributions of completed family sizes were projected for populations of 1,000 (Table 41).

Both parity progression ratios and projected family sizes for polygynous women by ordinal status disclosed that always monogamous wives and initially-monogamous first wives exhibited similar collective patterns of childbearing whereas women of other ordinal statuses had more small families (of fewer than 4 children). Excepting initially-polygynous first wives, the proportions having small families increased with each successive ordinal status. While approximately 2 per cent of always monogamous and initially-monogamous first wives had families smaller than 4 children, 16.65 per cent of initially-polygynous first wives had families as small, a proportion not exceeded until fifth ordinal status at which point 23.5 per cent had completed family sizes of 2 and 3 children. This percentage, however, is considerably higher than for second, third, and fourth wives of whom 5.6 per cent, 11.4 per cent, and 12.0 per cent respectively had a total of fewer than 4 children.

Additionally, always monogamous and initially-monogamous first wives ceased childbearing at later parities and at lower rates than was true for other ordinal statuses. For example, at ninth parity, 43.6 per cent and 43.9 per cent respectively of the latter two categories terminated or had terminated childbearing. By contrast, no initially-polygynous first wife had a child after ninth parity. As well, although all other ordinal statuses had a range greater than 9, wives of fifth and greater ordinal status completed childbearing by tenth

Table 40. Parity Progression Ratios by Ordinal Status of Wives

	Ordinal Status of Wife						
Parity	First Wife Initially Monogamous	First Wife Initially Polygynous	Second Wife	Third Wife	Fourth Wife	Fifth or Greater Wife	Always Monogamous Wife
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	.990	.917	.988	.962	.970	1.000	1.000
2	.997	1.000	.992	.974	.938	.824	.997
3	.990	.909	.963	.946	.967	.929	.984
4	.976	1.000	.953	.914	.862	.846	.982
5	.975	.900	.896	.906	.880	.909	.965
6	.938	.778	.854	.845	.773	.500	.948
7	.911	.714	.882	.816	.824	.200	.930
8	.855	.400	.852	.800	.643	1.000	.868
9	.826		.677	.750	.667		.793
10	.693		.651	.708	.667		.713
11	.653		.661	.412	.750		.542
12	.466		.460	.429			.614
13	.324		.412				.380
14	.546		.429				.526
15	.333						.450
16	.500						.333
17							.667

Table 41. Projected Frequency Distributions of Family Sizes for Populations of 1,000 by Ordinal Status of The Wife

	Ordinal Status of Wife											
	First Wife Initially Monogamous		First Wife Initially Polygynous		Second Wife		Third Wife		Fourth Wife		Fifth or Greater Wife	
Family Size	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage
1	10	1.00	83	8.30	12	1.20	38	3.80	30	3.00		
2	3	1.30			8	1.99	25	6.30	60	9.01	176	17.60
3	10	2.29	83	16.65	36	5.62	51	11.36	30	12.01	58	23.45
4	23	4.63			45	10.06	76	18.98	122	24.16	118	35.24
5	24	7.01	84	24.99	93	19.41	76	26.60	91	33.26	59	41.13
6	58	12.78	166	41.64	118	31.18	114	37.98	151	48.41	295	70.56
7	77	20.54	167	58.33	81	39.30	114	49.39	91	57.49	235	94.11
8	116	32.06	250	83.33	90	48.28	101	59.51	152	72.67		
9	118	43.88	167	100.00	167	64.99	101	69.63	91	81.77	59	100.00
10	172	61.11			122	77.21	89	78.50	60	87.84		
11	142	75.30			77	84.94	129	91.14	31	90.88		
12	132	88.49			82	93.08	51	96.20	91	100.00		
13	78	96.27			40	97.15	38	100.00				
14	17	97.96			17	98.78						
15	13	99.32			12	100.00						
16	4	99.66										
17	3	100.00										
Total	1000		1000		1000		1000		1000		1000	

parity. Of second, third, and fourth wives, 65.0 per cent, 69.6 per cent, and 81.8 per cent, respectively, ceased or had already ceased childbearing at ninth parity.

6.1:4 The Effects of Ordinal Status on Fertility

The data partially support the hypothesis that women entering unions in which there are already a greater number of wives present will have lower fertility relative to those entering unions with fewer wives present. An inverse relationship between ordinal status and fertility did obtain. However, it was not until the fourth ordinal status and later that polygynous fertility was significantly depressed relative to monogamous fertility. In addition, initially-polygynous first wives provided an exception to the above, their fertility being lower than that of second, third, and fourth wives.

Furthermore, it does not appear that decreased coital rates, which ostensibly would result in longer birth intervals, were a significant factor in reducing fertility. If depressed coital rates did in fact obtain, they were generally inconsequential in determining the frequency of conception. Instead, decreasing fertility with increasing ordinal status (and for initially-polygynous first wives) was associated with the four following factors. 1) The percentage of small families increased as ordinal status increased. 2) The proportions ceasing childbearing at each parity generally increased as ordinal status increased so that the rate of cessation of birth was higher with each successive ordinal status. 3) The parity at which childbearing was terminated declined with each successive ordinal status so that there was a narrower range of family size with each successive ordinal status. 4) It was only with the later ordinal statuses (fourth through ninth) and with initially-polygynous first wives that longer mean intergenetic intervals contributed to lower fertility.

6.2 Average Number of Wives Present

As was indicated in Chapter 1, it has frequently been hypothesized that the greater the number of wives present in a marriage the lower will be the coital rates and, therefore, the lower the fertility rates. As was also pointed out in Chapter 1, the number of wives present in a union is seldom constant from year to year throughout a marriage. Consequently, in examining the effects of the number of wives present in a marriage on fertility, the average number of wives present throughout each marriage was used.

The average number of wives present was determined by averaging the total number of wives present at each year of marriage by the number of years of marriage through age 46. Then, for purposes of analysis, the average number of wives was divided into five categories: one wife, two wives, three wives, four wives, and five or more wives. For this sample, there was no more than an average of eight wives present in any marriage.

6.2:1 Fertility and Average Number of Wives Present

Cross tabulations for age at marriage and average number of wives present in a marriage were performed. They revealed that, in accordance with predictions, as the average number of wives present in a marriage increased the level of fertility decreased, as can be observed in Table 42.

Moreover, when women in families in which there was an average of one wife were compared by age at marriage with monogamous wives, there was found to be an equal number of age categories in which fertility was higher for polygynous as well as for monogamous women. Conversely, when age categories for women who lived in polygynous families in which there was an average of two wives were compared with monogamous categories, it was found that fertility was not higher in any age category.

Calculating the mean fertility for each average-number-of-wives category disclosed that the same pattern of declining fertility with increasing number of wives prevailed. Moreover, mean fertility for all women whose own marriages had an average of one wife throughout was but 0.41 lower than for monogamous wives. The majority of polygynous women, 55 per cent, were in marriages averaging two wives. The mean fertility for this group was 0.80 lower than the mean fertility levels of monogamous women.

Although mean fertility of women in households with an average of three and four wives was similar, their fertility levels were lower than for those with an average of one or two wives. Fertility was 1.66 and 1.86 lower, respectively, where there were three and four wives relative to monogamous fertility. As well, wives in marriages which averaged five or more wives had fertility levels significantly lower, by 3.86, than their monogamous counterparts. However, this

Table 42. Mean Fertility of Polygynous Wives by Average Number of Wives Present throughout The Marriage and Age at Marriage for Those Continuously Married through Age 46

	Average Number of Wives Present									
	One Wife		Two Wives		Three Wives		Four Wives		Five or More Wives	
Age at Marriage	N	X̄	N	X̄	N	X̄	N	X̄	N	X̄
15 or Under	3	13.33	19	11.58	7	10.57	2	9.50		
16	7	11.86	44	10.43	4	9.50	2	8.00		
17	8	10.88	37	10.19	17	8.76	7	8.86		
18	8	9.13	56	9.66	17	9.00	8	9.50	3	5.00
19	9	9.44	48	9.33	27	8.67	6	8.00	2	5.50
20	10	9.50	34	9.94	14	8.50	5	8.40	3	8.00
21	7	8.00	28	8.75	9	7.44	2	7.00	2	9.50
22	5	9.20	19	8.95	11	8.55	8	9.25	3	8.00
23			26	7.08	7	8.14	3	4.33	3	6.33
24	4	7.00	18	7.22	4	7.50			3	5.00
25	1	7.00	15	6.80	2	8.00	5	7.40		
26 to 29	4	8.00	22	6.55	15	6.87	4	4.50		
30 to 33	4	6.00	9	3.89	7	4.29	1	5.00	3	3.00
34 or Over	1	4.00	4	3.50	5	2.20	2	3.50	2	2.00
Total	71	9.30	379	8.91	146	8.05	55	7.84	32	5.84
Standardized		9.60		9.31		8.55		8.20		6.63

category comprised only 4.69 per cent of polygynous wives continuously married through age 46.

Again, because of age-compositional differences, standardized rates were calculated using the monogamous population as the standard one. Standardization resulted in increasing fertility levels for all categories and decreased differences between these and monogamous fertility.

When standardized, virtually no differences (0.11 and 0.40) existed between the fertility of monogamous women and those women whose marriages averaged one and two wives throughout. However, where there averaged three and four wives in a marriage, fertility was 1.2 and 1.9 lower, respectively, than monogamous fertility. In addition, where there was an average of five and more wives, fertility was 3.1 lower than the fertility of women who were always monogamous.

6.2:2 Mean Birth Intervals

As fertility differentials were found between and increased with average number of wives, birth intervals were examined to determine if differences between length of birth intervals existed.

6.2:2a Protogenetic Birth Intervals. Examination of mean protogenetic birth intervals showed that, generally speaking, as the average number of wives increased the length of the mean protogenetic birth interval increased.

Although there was only one month's difference between the length of the intervals where there were one and two wives, the length of the mean interval increased with each successive category until the last, five or more wives, where the length decreased by 4.4 months. Moreover, the difference between the longest and shortest mean interval was 8.27 months, as can be seen in Table 43.

Relative to the mean protogenetic interval for monogamous women, polygynous mean protogenetic intervals were longer. Although there were only 0.8 month's and 1.8 months' difference where there were one and two wives, beyond this differences were greater and were significantly so where there were four wives. In this category, the mean protogenetic interval was 9.1 months longer than that for monogamous women.

6.2:2b Intergenetic Birth Intervals. Examining the mean intergenetic intervals by parity by number of wives present indicated no pattern of increasing and/or decreasing lengths. Moreover, the same was found with the mean intergenetic intervals for all women in each category. Where there were one, two, and four wives, the mean interval lengths were essentially identical; and, where there were three wives, the mean length was less than one month longer than these. Hence, the only difference worth noting was where there were at least five wives present. Here the mean interval was only between 2 and 3 months longer than for all other categories.

Comparing the monogamous mean intergenetic interval with these polygynous categories, the same as the above was found. There was, again, no difference between the monogamous mean interval length and the mean interval lengths where there averaged one, two, and four wives. There was but one month's greater difference where there were

Table 43. Mean Birth Intervals by Average Number of Wives Present

	Average Number of Wives Present									
	One Wife		Two Wives		Three Wives		Four Wives		Five or More Wives	
Birth Interval	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
1	71	15.24	379	16.24	146	18.08	55	23.51	32	19.09
2	70	27.54	376	24.50	144	26.03	54	26.17	30	26.87
3	69	28.77	373	26.79	140	27.88	52	33.79	28	27.39
4	67	28.84	362	28.89	136	29.50	50	27.06	26	31.12
5	65	27.31	349	28.19	130	28.59	48	28.79	22	37.23
6	61	29.33	331	29.72	122	31.33	42	27.98	20	36.05
7	57	31.82	298	30.39	102	31.49	37	31.00	11	31.55
8	53	28.11	267	29.52	85	31.34	31	29.94	8	40.38
9	47	28.26	229	31.08	67	32.52	23	26.74	6	36.50
10	39	29.41	173	31.55	51	31.69	18	26.94	1	27.00
11	25	32.16	125	28.52	29	29.03	12	28.75	1	9.00
12	17	27.41	82	32.10	13	29.23	7	26.29	1	20.00
13	5	29.80	43	31.53	6	28.67	2	25.00	1	58.00
14	4	23.50	11	26.91	3	29.00				
15	2	13.50	6	23.50	1	25.00				
16			2	29.00						
17			1	30.00						
$\bar{X}$ Intergenetic Interval		28.79		28.71		29.52		28.73		31.77
$\bar{X}$ Reproductive Span		20.90		20.47		18.85		18.33		14.42

three wives and 3.3 months' greater difference where there were five or more wives.

Apparently, then, differential fertility between these polygynous and monogamous women cannot be accounted for by differences in child spacing only.

6.2:3 Parity Progression Ratios.

As differential mean intergenetic intervals do not account for fertility differentials, parity progression ratios were developed (Table 44) and frequency distributions of family sizes projected (Table 45) to determine differential cessation of childbearing.

Examination of these tables revealed that, generally, as the number of wives present in a marriage increased the proportion of women who ceased childbearing at each parity increased.

Generally, where there was a larger number of wives present in the marriage, and concomitantly lower fertility, a higher proportion of small families prevailed. Where there was an average of three, four and five or more wives present, 6.9 per cent, 9.0 per cent, and 18.7 per cent of wives, respectively, had completed family sizes smaller than four compared to 5.6 per cent and 4.5 per cent of wives where there was an average of one and two wives present.

In addition, childbearing ceased in greater proportions where there was a greater average number of wives present. Illustratively, by ninth parity, 63.5 per cent, 67.2 per cent, and 96.7 per cent of women ceased or had previously ceased childbearing where there were three, four, and five or more wives present whereas only 45.0 per cent

Table 44. Parity Progression Ratios by Average Number of Wives Present

Parity	One Wife	Two Wives	Three Wives	Four Wives	Five Plus Wives
	Average Number of Wives				
0	1.000	1.000	1.000	1.000	1.000
1	.986	.992	.986	.982	.938
2	.986	.992	.972	.963	.933
3	.971	.971	.971	.962	.929
4	.970	.964	.956	.960	.846
5	.939	.948	.939	.875	.909
6	.934	.900	.836	.881	.550
7	.930	.896	.833	.838	.727
8	.887	.858	.788	.742	.750
9	.830	.756	.761	.783	.167
10	.641	.723	.569	.667	1.000
11	.680	.656	.448	.583	1.000
12	.294	.524	[illegible]	.286	1.000
13	.800	.256	[illegible]		
14	.500	.546	.333		
15		.333			
16		.500			

Table 45. Projected Frequency Distributions of Family Size by Average Number of Wives Present

	Average Number of Wives									
	One Wife		Two Wives		Three Wives		Four Wives		Five Plus Wives	
Family Size	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage
1	14	1.40	8	0.80	14	1.40	18	1.80	62	6.20
2	14	2.78	8	1.59	28	4.16	36	5.43	63	12.49
3	28	5.60	28	4.45	27	6.94	36	9.03	62	18.70
4	28	8.43	35	7.89	41	11.03	37	12.67	125	31.22
5	56	14.02	48	12.68	16	12.62	109	23.58	63	37.48
6	57	19.69	87	21.41	143	26.95	91	32.68	281	65.61
7	56	25.31	82	29.58	122	39.15	109	43.58	94	75.00
8	85	33.75	100	39.58	129	52.05	145	58.14	63	81.25
9	112	45.01	147	54.32	115	63.51	91	67.22	156	96.87
10	198	64.75	127	66.98	157	79.24	109	78.14		
11	112	76.03	113	78.34	115	90.70	92	87.25		
12	170	92.95	103	88.65	50	95.70	91	96.35		
13	14	94.36	85	97.09	21	97.85	36	100.00	31	100.00
14	28	97.18	13	98.41	15	99.28				
15	28	100.00	11	99.47	7	100.00				
16			2	99.74						
17			3	100.00						
Total	1000		1000		1000		1000		1000	

and 54.3 per cent of women in marriages averaging one and two wives did not bear a tenth child. Furthermore, while no woman in a union averaging four or more wives had more than 13 children, women in families averaging one or three wives had as many as 15 children, and women in two-wife families bore as many as 17 children.

Although fertility was quite similar in marriages averaging one and two wives, childbearing patterns were somewhat different. Where there were two wives present, women had somewhat fewer small families of five or less children and a greater range of family size than was true for women in marriages where the average number of wives was one. In the latter case, however, the rate of cessation of childbearing between the sixth parity and the fourteenth parity inclusive was somewhat less than for the former category.

6.2:4 The Effects of Average Number of Wives Present on Fertility

In accordance with prediction, the greater the number of wives present in a marriage the lower the fertility relative to the fertility of always monogamous wives.

It was found, however, that differences in fertility were not introduced until there were three wives present, and, that where the average number of wives was one and two, fertility was consistent with that of monogamous spouses. However, where there were three wives present, mean fertility (using standardized rates) was 1.1 lower and increased to 1.5 where there were four wives present. However, where there were five or more wives in a marriage, fertility was significantly reduced relative to monogamous fertility, being 3.1 lower.

According to the polygyny-fertility hypothesis, these fertility differences were due to decreased coital frequencies. This, however, would be reflected by increased length of the birth interval between confinements. Although differences were found between the lengths of protogenetic intervals, particularly where there were a large number of wives present, mean intergenetic differences were absent except where there were five or more wives. However, what differences existed cannot account for differential fertility.

However, an examination of parity progression ratios showed that reduced fertility was, at least in part, due to cessation of childbearing at earlier parities and to the greater proportions terminating childbearing at these earlier parities.

6.3 Percentage of Married Years in A Polygynous Union

As was discussed in both Chapters 1 and 3, not all polygynous women spend the entirety of their married years in polygynous unions. Of this sample, only 51 per cent lived exclusively in polygyny.

Following the polygyny-fertility hypothesis, it is to be expected, again, that the higher the percentage of years spent in polygynous unions the lower will be the fertility as the period of time lower coital frequency rates prevailed would be greater.

For this study, percentage of years spent in a polygynous union was defined as the percentage of years between age at marriage and age 46 inclusive which were spent in polygyny. Percentage of years was further divided into five categories for purposes of analysis: 100 per cent, 75 per cent to 99 per cent, 50 per cent to 74 per cent, 25 per cent to 49 per cent, and 24 per cent or less.

6.3:1 Percentage of Years Polygynous and Fertility

Cross tabulations for age at marriage and percentage of years polygynous indicated that, generally, women who spent 100 per cent of their married lives in polygyny had the lowest mean fertility rates at each age at marriage relative to their polygynous counterparts, as can be observed in Table 46. Moreover, the same held when compared with monogamous women by age at marriage. A comparison between the other categories failed to reveal any pattern of increasing or decreasing mean fertility by age at marriage as percentage of years spent in polygyny increased.

Although it was to be expected that as percentage of years spent in a polygynous union decreased fertility would increase, when mean fertility rates for all women in each category were calculated, this was not found to be the case. Instead, a fluctuating pattern is seen. Moreover, no significant differences were found between the mean fertility levels of those spending between 25 per cent and 99 per cent of their married lives in polygynous unions. The mean number of children for all women in these three categories was somewhat greater than 9.0.

Very few women spent less than 25 per cent of their married lives in polygynous unions (2.8 per cent); and, although these numbers make the findings insignificant, their fertility was approximately only 0.5 lower relative to all other "part-time" polygynous wives. By contrast, the mean fertility of those who spent their entire married

Table 46. Mean Fertility of Polygynous Wives by Percentage of Married Years Polygynous and Age at Marriage for Women Married through Age 46

Age at Marriage	Percentage of Married Years Polygynous									
	100%		75% to 99%		50% to 74%		25% to 49%		To 24%	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
15 or Under	11	10.36	9	12.67	7	10.29	1	13.00	3	13.33
16	17	9.65	16	11.13	16	10.13	6	11.64	2	11.00
17	39	8.92	10	10.20	15	10.40	7	10.43	2	11.00
18	46	8.65	22	10.32	15	9.93	6	11.00	3	6.00
19	49	8.51	18	9.50	16	9.56	9	9.44		
20	31	8.68	12	10.42	14	9.71	8	9.63	1	8.00
21	25	7.88	9	8.22	7	10.00	4	6.25	3	10.00
22	27	8.44	4	9.50	10	9.50	4	10.25	1	5.00
23	22	6.68	5	8.60	12	6.92				
24	12	6.08	5	7.20	7	8.43	5	7.00		
25	9	6.78	9	7.67	4	6.25	1	7.00		
26 to 29	32	6.03	6	6.50	7	7.00	2	9.00	2	6.00
30 to 33	16	3.81	3	4.33	1	6.00	2	7.50	2	4.50
34 and Over	10	2.50	2	3.00	1	3.00	1	4.00		
Total	346	7.78	130	9.52	132	9.25	56	9.43	19	8.63
Standardized Mean		8.40		9.69		9.53		9.83		

lives in polygyny was 7.8, approximately 1.5 lower than that of their "part-time" polygynous counterparts.

Relative to monogamous fertility, the fertility of women spending between 25 per cent and 99 per cent of their marriages in polygyny, although being somewhat depressed by 0.28 and 0.19, was virtually the same. By comparison, those whose marriages were 100 per cent polygynous had mean fertility levels 1.93 lower than their monogamous counterparts.

In an attempt to account for disproportionate age distributions, standardization was employed for those in polygynous marriages for at least 25 per cent of their married lives. The monogamous sample was used as the standard population.

Standardization again increased mean fertility rates and reduced differences between the fertility of the polygynous categories relative to the monogamous population.

The differences between the fertility of women married exclusively in polygynous unions and the fertility of monogamous women was reduced to 1.3. Moreover, no differences existed between the fertility of those always monogamous and those 75 per cent to 99 per cent polygynous when standardized rates were employed; and the difference between monogamous fertility and the fertility of those 50 per cent to 74 per cent polygynous was 0.18, again a very small difference. Standardization increased the fertility of those spending 25 per cent to 49 per cent of their years in polygynous unions to a level 0.12 higher than monogamous fertility, again essentially the same. It should be pointed out that there were very few women in this category relative to the others.

6.3:2 Mean Birth Intervals

Although virtually no differences existed between time spent in polygynous unions and fertility, except for those spending their entire married lives in polygyny, mean birth intervals were, nevertheless, examined.

6.3:2a Protogenetic Birth Intervals. As might be expected, there was essentially no difference in the mean length of protogenetic intervals for those who spent between 25 per cent and 99 per cent of their married years in polygynous unions. Moreover, for those always polygynous, first children were born, on the average, between 3 and 4 months later after marriage than was true for those spending less of their married years in polygyny.

Compared to monogamous mean protogenetic interval lengths, those always polygynous experienced mean intervals which were 4.6 months longer. In contrast, other polygynous wives had their first child between 0.7 months and 1.5 months later than did their monogamous counterparts.

6.3:2b Intergenetic Birth Intervals. An examination of mean intergenetic birth intervals between categories by percentage of years polygynous indicated little difference between, as can be noted in Table 47.

Those spending between 25 per cent to 49 per cent and 75 per cent to 99 per cent of their married lives in polygyny had virtually

Table 47. Mean Birth Intervals for Polygynous Women Married through Age 46 by Percentage of Married Years Polygynous

Birth Interval	Percentage of Married Years Polygynous									
	To 24%		25% to 49%		50% to 74%		75% to 99%		100%	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
1	19	17.42	56	15.21	132	15.94	130	15.14	346	19.03
2	19	28.53	55	26.33	131	25.34	128	23.64	339	25.76
3	19	24.95	54	27.87	131	26.31	127	26.02	331	29.22
4	18	27.39	54	28.85	130	29.82	124	27.47	316	29.14
5	17	29.29	53	26.74	127	28.03	121	27.20	296	29.72
6	15	30.27	51	29.94	124	30.34	117	29.73	268	30.32
7	13	30.00	49	31.71	112	32.01	112	29.81	219	30.33
8	12	28.08	45	28.02	99	29.17	104	29.16	184	31.20
9	9	32.22	39	28.54	81	31.63	90	29.46	152	31.95
10	9	30.22	31	28.74	64	35.17	72	30.10	106	29.75
11	5	43.00	20	31.65	37	28.54	57	30.00	69	28.28
12	3	36.33	15	25.27	29	33.45	32	30.75	41	29.61
13	2	21.00	4	36.00	15	28.13	18	33.78	15	31.20
14	2	26.00	2	21.00	5	17.40	3	34.33	6	32.17
15	2	13.50			2	23.50	2	24.50	3	23.33
16					1	12.00	1	38.00		
17					1	30.00				
$\bar{X}$ Intergenetic Interval		28.93		28.57		29.27		28.15		29.35
$\bar{X}$ Reproductive Span		19.85		21.32		21.45		21.25		18.16

identical means. Those in the remaining categories had mean intervals which were very similar as well. The difference between the longest and the shortest mean intergenetic interval, however, was but 1.2 months. Moreover, the mean intergenetic interval for monogamous women, 28.5, was consistent with the mean intervals found for these polygynous categories.

6.3:3 Parity Progression Ratios

Although no differences were found between these polygynous categories, except for women living exclusively in polygynous unions, parity progression ratios were constructed (Table 48) and frequency distributions of family size were projected (Table 49).

As would be expected from previous analysis, the somewhat lower fertility of women who were always polygynous relative to always monogamous spouses and other polygynous wives was a result of their having more small families and greater proportions ceasing childbearing at earlier parities than was true for the remainder.

6.3:4 The Effects of The Percentage of Years Polygynous on Fertility

It appears that the percentage of time spent in polygyny per se was not a significant factor affecting fertility. It is clear that the ordinal status of the wife and the number of wives present were more important factors in depressing fertility.

However, it is to be expected that the percentage of time spent in polygynous unions was not equally distributed by ordinal status nor by average number of wives present in a marriage. It is to be expected

Table 48. Parity Progression Ratios for Polygynous Wives Married through Age 46 by Percentage Married Years Polygynous

	Percentage Married Years Polygynous				
Parity	To 24%	25%-49%	50%-74%	75%-99%	100%
0	1.000	1.000	1.000	1.000	1.000
1	1.000	.982	.992	.985	.980
2	1.000	.982	1.000	.992	.976
3	.947	1.000	.992	.976	.955
4	.944	.982	.977	.976	.937
5	.882	.962	.976	.967	.905
6	.867	.961	.903	.957	.817
7	.923	.918	.884	.929	.840
8	.750	.867	.818	.865	.826
9	1.000	.795	.790	.800	.697
10	.556	.645	.578	.792	.651
11	.600	.750	.784	.561	.594
12	.667	.267	.517	.563	.366
13	1.000	.500	.333	.167	.400
14	1.000		.400	.667	.500
15			.500	.500	
16			1.000		

Table 49. Frequency Distributions of Family Sizes for 1000 Families Per Percentage of Married Years Polygynous

	Percentage Married Years Polygynous									
	To 24%		25% to 49%		50% to 74%		75% to 99%		100%	
Family Size	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage
1			18	1.80	8	0.80	15	1.50	20	2.00
2			18	3.57			8	2.29	24	4.35
3	53	5.30			8	1.59	23	4.64	43	8.65
4	53	10.60	17	5.30	23	3.86	23	6.93	57	14.41
5	106	21.15	36	8.90	23	6.16	31	10.00	81	22.54
6	104	31.64	36	12.45	91	15.27	39	13.87	142	36.72
7	53	36.90	71	19.63	98	25.09	61	19.99	101	46.84
8	158	52.68	107	30.32	136	38.73	108	30.79	93	56.09
9			143	44.61	128	51.59	138	44.63	133	69.39
10	210	73.69	197	64.27	204	72.02	115	56.15	107	80.07
11	105	84.21	89	73.20	61	78.06	193	75.40	81	88.16
12	53	89.47	196	92.84	106	88.66	107	86.15	75	95.66
13			36	96.42	75	96.22	116	97.69	26	98.26
14			36	100.00	23	98.49	8	98.46	8	99.13
15	105	100.00			7	99.24	7	99.23	9	100.00
16							8	100.00		
17					8	100.00				
Total	1000		1000		1000		1000		1000	

that a greater percentage of those with higher ordinal status would spend their entire married lives in polygyny than would be true for first wives.

Consequently, cross tabulations of percentage of years polygynous with ordinal status and average number of wives were made. In addition, ordinal status and average number of wives present were cross tabulated to determine what differences in mean fertility and mean birth intervals existed between categories. It is to be expected, in view of previous findings, that as ordinal status increased and average number of wives present increased concomitantly fertility would decrease.

6.4 Ordinal Status and Percentage Years Polygynous

As was to be expected, it was found in this sample that the greater the ordinal status of a woman the greater the percentage of polygynous years married.

Of first wives, no initially-monogamous woman could be totally polygynous and very few women (N=12) were initially-polygynous, so that a percentage of those living entirely in polygynous unions would be misleading. Nonetheless, of initially-polygynous first wives, 10 were always polygynous.

The majority of wives of higher ordinal statuses lived entirely in polygynous unions, and the proportions doing so increased somewhat with each ordinal status. Whereas 85.47 per cent of second wives were exclusively polygynous, 97.47 per cent of third wives and 98.0 per cent of wives of fourth or greater ordinal status were.

Moreover, of first wives who were initially monogamous, only 37.84 per cent spent as much as 75 per cent of their married lives in polygynous unions. By contrast, a considerably lower percentage of wives of higher ordinal statuses experienced polygyny during 75 per cent to 99 per cent of their married lives: 5.96 per cent of second wives and 2.53 per cent of third wives.

In addition, while 40.57 per cent of initially monogamous first wives spent between 50 and 74 per cent of their marriages in polygynous unions, only 4.47 per cent of second wives did so. Furthermore, 21.62 per cent of initially monogamous first wives spent less than 50 per cent of their marriages in polygyny while only 4.47 per cent of second wives did and no wife of higher ordinal status spent so little time in a polygynous union.

6.4:1 Fertility, Ordinal Status, and Percentage Years Polygynous

Percentage of years polygynous and ordinal status were cross tabulated to determine fertility differentials. Although the numbers in polygynous unions for less than 100 per cent of their married time are very small at ordinal statuses greater than one, it was found that within each percentage-of-years-polygynous category as ordinal status increased fertility decreased. Moreover, and perhaps unexpectedly, as percentage of years spent in polygyny decreased, fertility within each ordinal status generally decreased also, although this was not true for all ordinal statuses and was not consistently true for others.

By contrast, the percentage of years spent in polygynous unions seems to have had little effect on the fertility of initially-monogamous first wives. Although those with the highest mean fertility (9.88) spent 75 per cent to 99 per cent of their married lives in a polygynous union, the fertility of those spending less time is not significantly affected. In spite of the fact that those spending less than 25 per cent of their time in polygynous unions had almost one fewer child on the average, their numbers were small and, therefore, the difference probably not meaningful.

As the majority of those whose ordinal status was greater than one lived exclusively in a polygynous union, the fertility of those women was compared with the fertility of always monogamous and initially-monogamous first wives. It was found that initially-monogamous first wives, regardless of percentage years polygynous, had higher fertility than wives of higher ordinal statuses married exclusively in polygyny, as can be observed in Table 50. Thus, a wife's ordinal status appears to have depressed her fertility.

While the fertility of always monogamous wives and initially-monogamous first wives was essentially the same, although the fertility of initially-monogamous first wives was slightly higher, as ordinal status increased, fertility differences between these and monogamous women increased. Second wives experienced 1.45 fewer births than monogamous wives while third wives had 2.13 fewer and fourth wives 2.95 fewer births than did monogamous spouses. In addition, wives of fifth or greater ordinal status had a mean fertility level 4.40 lower than monogamous women. Again, however, the numbers in the last category were so small as to render the findings meaningless.

Table 50. Mean Fertility of Polygynous Wives Continuously Married through Age 46 by Percentage of Married Years Polygynous and Ordinal Status

Ordinal Status	Percentage of Married Years Polygynous									
	To 24%		25% to 49%		50% to 74%		75% to 99%		100%	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
First Wife Initially Polygynous							2	4.50	10	6.80
First Wife Initially Monogamous	16	9.00	48	9.65	120	9.31	112	9.88		
Second Wife	3	7.33	8	8.25	11	9.36	14	7.86	210	8.26
Third Wife							2	4.50	77	7.58
Fourth Wife									33	6.76
Fifth Wife or Greater					1	4.00			16	5.31

6.4:2 Mean Birth Intervals

A comparison was made of mean birth intervals to determine if significant differences existed between ordinal statuses when percentage of years polygynous was controlled for.

6.4:2a Protogenetic Birth Intervals. To begin with, first wives who were initially-monogamous had the shortest mean birth intervals, being essentially the same regardless of the percentage of years spent in polygyny. In contrast, for those exclusively polygynous wives, the mean protogenetic interval increased with each successive ordinal status until the fifth or greater where it declined.

While initially-monogamous first wives, 75 per cent to 99 per cent polygynous, had their first confinement approximately one month later than always monogamous spouses, wives of higher ordinal status who were exclusively polygynous postponed first births to a somewhat later date. However, as can be seen in Table 51, none had a mean interval as great as 9 months longer than the mean monogamous interval.

6.4:2b Intergenetic Birth Intervals. Although mean protogenetic intervals were somewhat longer with greater ordinal status, mean intergenetic intervals were relatively consistent throughout. The only exception to this was wives of fifth and greater ordinal status who spaced their children approximately 6 months further apart on the average than did all other polygynous spouses married exclusively in polygynous marriages, initially-monogamous first wives, and always monogamous spouses. Hence, except for fifth and greater ordinal status, differential intergenetic birth intervals did not account for differential fertility between ordinal statuses.

Table 51. Mean Birth Intervals for Polygynous Wives Continuously Married through Age 46 by Percentage of Married Years Polygynous and Ordinal Status

	Percentage of Married Years Polygynous														
	To 24%			25% to 49%			50% to 74%			75% to 99%			100%		
Ordinal Status	N	$\bar{X}$ Protogenetic Interval	$\bar{X}$ Intergenetic Interval	N	$\bar{X}$ Protogenetic Interval	$\bar{X}$ Intergenetic Interval	N	$\bar{X}$ Protogenetic Interval	$\bar{X}$ Intergenetic Interval	N	$\bar{X}$ Protogenetic Interval	$\bar{X}$ Intergenetic Interval	N	$\bar{X}$ Protogenetic Interval	$\bar{X}$ Intergenetic Interval
First Wife Initially Polygynous										2	13.50	33.71	10	14.70	32.16
First Wife Initially Monogamous	16	15.38	27.77	48	14.50	25.71	120	15.11	29.09	112	15.25	27.96			
Second Wife	3	23.33	32.53	8	19.50	24.75	11	25.18	29.75	14	12.93	28.39	210	18.16	29.02
Third Wife										2	26.00	32.86	77	20.47	29.05
Fourth Wife													33	22.30	30.09
Fifth Wife or Greater							1	14.00	44.00				16	19.38	35.10

6.5 Average Number of Wives and Percentage Years Polygynous

Cross tabulation of percentage of years polygynous and average number of wives present in a marriage confirmed that the greater the number of wives in a marriage the greater the percentage of married years a woman spent in polygyny.

It was found that 97.2 per cent of those women in unions where there was an average of one wife spent less than one-half their married years in a polygynous union. Moreover, 26.8 per cent spent less than 25 per cent of their married lives in polygynous unions. In contrast, where there was an average of two wives, none spent less than one-half of their married years in polygynous unions. Instead, 63.4 per cent spent at least 75 per cent of their married years in a polygynous union and 37.4 per cent lived entirely in plural marriage.

Of women who were in unions in which there were three wives on the average, 95.9 per cent were in polygynous unions for at least 75 per cent of their married lives and 83.3 per cent were exclusively polygynous. Additionally, where there was an average of four wives throughout a marriage, no woman spent less than 75 per cent of her married life in polygyny and 94.6 per cent were always in a plural marriage.

Where numbers were sufficiently large to be meaningful, analysis revealed that women living in two-wife families and spending between 75 and 99 per cent of their married lives in polygynous unions had highest mean fertility, it being 9.75, 0.04 higher than for always monogamous women. By contrast, the mean fertility for women married exclusively in polygynous unions averaging a minimum of five wives was lowest at 9.50, 3.81 lower than for always monogamous wives.

Moreover, within each percentage-of-years-polygynous category, as the average number of wives in a union increased fertility generally declined, as can be observed in Table 52. However, for women who were exclusively polygynous, fertility differences between two-, three-, and four-wife families were insignificant and these women exhibited virtually identical fertility. It was not until there averaged at least five wives in a union that mean fertility was significantly reduced. Women in these unions had two fewer children, on the average, than other women married exclusively in polygyny.

Comparing fertility for each average-number-of-wives-present category by the percentage years polygynous, it was found that, except for those exclusively polygynous, percentage years polygynous did not affect mean fertility levels significantly. This was particularly noticeable in two-wife families. In this instance, essentially identical fertility levels obtained regardless of the percentage of married years spent in polygynous unions, as long as it was less than 100 per cent.

Moreover, average number of wives generally had a greater affect on mean fertility than did percentage years polygynous. A comparison of the fertility of women in families with three or more wives with that of women in two-wife families revealed that in the former situation there was less difference between the means of those exclusively polygynous and those less than 100 per cent polygynous than there was in the latter case.

Table 52. Mean Fertility of Polygynous Wives Continuously Married through Age 46 by Percentage of Married Years Polygynous and Average Number of Wives Present

Average Number of Wives	Percentage of Married Years Polygynous									
	To 24%		25% to 49%		50% to 74%		75% to 99%		100%	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
One	19	8.79	50	9.44			1	10.00	1	3.00
Two			6	9.33	125	9.31	106	9.75	142	8.11
Three					6	9.17	20	8.55	120	7.90
Four							3	7.00	52	7.88
Five and More					1	4.00			31	5.90

Percentage of years spent in polygyny was highly correlated with ordinal status and average number of wives present in a marriage. Moreover, other than for those 100 per cent polygynous, percentage years polygynous was not a significant factor per se in affecting fertility levels. Consequently, these latter two variables--the ordinal status of the wife and the average number of wives present in a marriage--were cross tabulated to determine fertility differences.

6.6 Ordinal Status and Average Number of Wives Present

Cross tabulations revealed that over one-half of polygynous wives (53.15 per cent) either were initially-monogamous first wives in two-wife families or were of second ordinal status in two-wife families. Another 12.15 per cent of women were initially-monogamous first wives in unions averaging one or two wives; 10.40 per cent were second wives in three-wife families; and 9.81 per cent were of third ordinal status in marriages where there were either three or four wives on the average. Fourth wives in four-wife families comprised only 2.93 per cent of polygynous wives. The above categories accounted for 88.44 per cent of the polygynous sample. The majority of categories, accounting for 11.56 per cent of the total, contained too few numbers to be meaningful, as can be observed in Table 53.

6.6:1 Fertility, Ordinal Status, and Average Number of Wives Present

Examination of mean fertility by categories revealed that, of those categories sufficiently large to be meaningful, initially-monogamous first wives in two-wife families had highest mean fertility, being 9.72. Moreover, this level was equal to that of monogamous wives. Of other initially-monogamous first wives, those in marriages averaging one wife throughout had essentially the same fertility as those in two-wife families, being but 0.21 lower, while those in three-wife families had almost one fewer child than their counterparts in two-wife families. All other wives had at least one fewer child than initially-monogamous first wives in two-wife families.

Second wives had essentially the same fertility regardless of whether they were in two-wife or three-wife families. Conversely, third wives in three-wife families had 1.48 lower fertility than their counterparts in four-wife families. However, this difference could be a consequence of the small numbers in the latter category.

Within average-number-of-wives categories, as ordinal status increased, fertility generally declined. Thus, in two-wife families, wives of second ordinal status had 1.45 fewer children than did initially-monogamous first wives. In three-wife families, the fertility of second wives was 0.51 lower than that of initially-monogamous first wives, and the mean fertility of third wives was 1.25 lower than that of second wives and 1.76 lower than that of initially-monogamous first wives. In addition, wives of fourth ordinal status in four-wife families averaged 1.19 fewer children than did third wives in equivalent sized families.

In spite of the small numbers in the majority of categories, it appears that as both ordinal status and average number of wives present in a marriage increased, fertility decreased. Although initially-monogamous first wives had fertility identical to always monogamous

Table 53. Mean Fertility of Polygynous Wives Continuously Married through Age 46 by Average Number of Wives Present and Ordinal Status

Ordinal Status	Average Number of Wives Present									
	One		Two		Three		Four		Five and More	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
First Wife Initially Polygynous			9	6.00	2	7.50			1	8.00
First Wife Initially Monogamous	59	9.51	209	9.72	24	8.92	3	7.00	1	4.00
Second	11	8.00	154	8.27	71	8.41	7	7.71	3	8.00
Third	1	3.00	4	9.25	45	7.16	22	8.64	7	5.86
Fourth			1	4.00	3	8.00	20	7.45	9	5.11
Fifth and Greater			2	3.00	1	2.00	3	5.67	11	5.82

spouses, wives of second ordinal status in two-wife families had 1.44 fewer children. In addition, third wives in three-wife families had 2.56 fewer children than did monogamous wives. However, fourth wives in four-wife families had a mean fertility 2.26 lower and fifth wives in five-wife families had a mean fertility 3.89 lower than that of always monogamous women. Nevertheless, the numbers in the latter two categories may be too small to be any more than indicative of a trend.

As women married between ages 17 and 21 inclusive are at risk during their most fecund years and for a longer period of time than women married at older ages, the fertility of these women only was calculated for sufficiently large categories. Moreover, in order to eliminate whatever existent age-compositional differences, these were standardized using the corresponding monogamous sample as the standard population.

To begin with, computing fertility rates for these women revealed that monogamous women married between ages 17 and 21 had an average completed family size of 9.93. Similarly, initially-monogamous first wives in one-wife and two-wife families had fertility rates of 9.62 and 10.38 respectively, essentially the same as for always monogamous wives. Furthermore, women who were initially-monogamous first wives in three-wife families and second wives in two-wife and three-wife families had the same fertility, as can be observed in Table 54. These women had average completed families of 9 children, almost one child fewer than did always monogamous women.

Significant differences did not appear until women were of third ordinal status in three-wife families. For these women, mean fertility

Table 54. Mean Fertility for Polygynous Women Continuously Married through Age 46 by Ordinal Status and Average Number of Wives Present and by Age at Marriage 17 to 21 Years

	Ordinal Status and Average Number of Wives Present							
			First Wife Initially Monogamous		First Wife Initially Monogamous		First Wife Initially Monogamous	
Age at Marriage	Always Monogamous Wife		One-Wife Family		Two-Wife Family		Three-Wife Family	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
17	104	11.10	8	10.88	21	10.38	4	9.00
18	129	10.60	7	9.43	34	10.50	1	8.00
19	107	10.80	6	10.33	27	9.63	6	9.50
20	82	9.10	9	9.22	22	10.25	1	10.00
21	71	9.10	6	7.50	13	9.92		
Total	493	9.93	36	9.53	117	10.16	12	10.08
Standardized Mean Fertility		9.93		9.62		10.38		9.02

Table 54. (continued)

	Ordinal Status and Average Number of Wives Present							
	Second Wife		Second Wife		Third Wife		Third Wife and Greater	
Age at Marriage	Two-Wife Family		Three-Wife Family		Three-Wife Family		Four-Wife and Greater Family	
	N.	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
17	14	9.93	5	9.60	8	8.13	5	10.80
18	19	8.79	10	9.00	5	9.20	7	9.29
19	19	9.05	14	8.67	6	7.83	8	7.38
20	12	9.17	6	9.00	7	7.86	6	8.00
21	15	7.73	4	9.00	3	5.33	2	6.50
Total	79	9.42	39	8.95	29	7.90	28	8.54
Standardized Mean Fertility		9.00		9.05		7.90		7.95

was 7.90, 3.03 lower than for monogamous wives. Additionally, because of the small numbers in further individual categories, these were collapsed into one. This category included those of third ordinal status in four-wife families, those of fourth ordinal status in four-wife families, and those of fifth ordinal status in five-wife families. The mean fertility for this category was 7.95.

6.6:2 Birth Intervals

The birth intervals for these select categories of ordinal status by average number of wives comprised of those married between ages 17 and 21 were examined. As these women were essentially of the same age cohort at marriage, presumably whatever differences in mean birth intervals obtained would have resulted from factors other than lower fecundability due to older age at marriage.

6.6:2a Protogenetic Birth Intervals. The mean protogenetic birth interval for monogamous women married between these ages was 14.31. Both those initially-monogamous first wives in one-wife families and in two-wife families had somewhat shorter, though not significantly so, first intervals, as can be observed in Table 55.

Initially-monogamous first wives in three-wife families had first birth intervals of 18.50 months, while second wives in three-wife families experienced first births 16.46 months after marriage. However, all other wives experienced first births approximately 5 months and 3 weeks later than did always monogamous first wives.

6.6:2b Intergenetic Birth Intervals. The mean second interval for always monogamous women was 23.46 months, 0.63 months longer than

Table 55. Mean Birth Intervals by Selected Ordinal Status and Average Number of Wives Present for Polygynous Women Married at Ages 17 through 21 and Continuously Married through Age 46

	Ordinal Status and Average Number of Wives Present													
	First Wife Initially Monogamous		First Wife Initially Monogamous		First Wife Initially Monogamous		Second Wife		Second Wife		Third Wife		Third Wife and Greater	
Birth Interval	One-Wife Family		Two-Wife Family		Three-Wife Family		Two-Wife Family		Three-Wife Family		Three-Wife Family		Four-Wife and Greater Family	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
1	36	13.61	117	14.01	12	18.50	79	20.08	39	16.46	29	19.93	28	19.93
2	36	28.31	116	22.83	12	26.75	79	26.47	38	28.11	29	26.31	28	25.43
3	35	29.09	116	25.44	12	28.42	79	28.27	38	24.82	29	31.38	28	34.71
4	34	28.09	115	27.88	12	28.33	76	28.76	38	31.37	27	28.63	27	26.56
5	34	26.79	115	27.23	12	26.17	73	29.15	37	28.30	26	31.77	25	30.72
6	32	31.03	114	28.18	12	32.92	68	30.75	35	31.80	24	32.42	24	31.08
7	32	34.97	111	30.61	12	32.50	60	29.18	31	29.87	21	32.76	21	30.24
8	30	28.70	104	28.30	12	34.25	55	30.89	28	33.46	16	32.56	18	30.39
9	26	28.27	95	31.67	6	27.83	50	31.68	24	33.25	13	37.00	13	26.62
10	24	29.79	75	32.44	6	35.83	35	31.17	18	31.89	8	24.88	12	28.00
11	14	35.21	56	29.16	3	44.33	26	29.73	11	27.36	6	32.33	8	29.50
12	8	28.00	33	31.58			16	30.56	8	26.88	1	49.00	5	27.20
13	1	29.00	13	27.92			6	41.17	3	26.67			2	25.00
14	1	20.00	5	17.00			1	26.00	1	31.00				
15			2	23.50			1	28.00						
16			1	12.00										
17			1	30.00										
$\bar{X}$ Intergenetic Birth Interval		29.62		28.12		30.58		29.47		29.76		30.91		29.39

for initially-monogamous first wives in two-wife families. However, second birth intervals in all other categories were longer than the mean monogamous interval by from between 1.97 months to 4.85 months. From second interval on, however, mean interval lengths were inconsistent relative to monogamous means--being either less than, equal to, or exceeding them.

Consequently, mean intergenetic intervals for each category were computed. A comparison of these disclosed that monogamous women spent an average of 28.59 months between confinements excluding the first compared to 28.12 months for initially-monogamous first wives in two-wife families. However, in all other categories, mean intergenetic intervals exceeded that for monogamous wives. Nevertheless, less difference existed between these mean intervals and the monogamous mean interval than was found between mean protogenetic intervals of polygynous and monogamous women. There was no difference as great as 2.50 months between the monogamous mean intergenetic interval and polygynous mean intervals.

An examination of protogenetic and intergenetic birth intervals and fertility levels revealed that the greater the ordinal status and the greater the average number of wives present the less the birth intervals accounted for depressed fertility relative to monogamous fertility.

Differences in mean birth intervals could account for approximately 84 per cent of the fertility difference for initially-monogamous first wives in one-wife families and 77 per cent for those in two-wife families. However, differential birth intervals could account for only approximately 49 per cent of the fertility differences for second wives in two-wife families and 45 per cent for those in three-wife families. Similarly, differential birth intervals could account for 42 per cent of the difference in fertility for third wives in three-wife families but for only 21 per cent in that collapsed category including third wives in four-wife families, fourth wives in four-wife families, and fifth wives in five-wife families. It is therefore apparent that where fertility differences are greatest differences in mean birth intervals are not sufficiently lengthy to be responsible.

As a result, parity progression ratios (Table 56) were computed for these categories and frequency distributions of family sizes (Table 57) projected.

6.6:3 Parity Progression Ratios

An examination of parity progression ratios and projected frequency distributions of completed family size for women married between the ages of 17 and 21 disclosed three general relationships between fertility and family size distribution.

Firstly, there existed, in general, an inverse relationship between fertility and the proportions of women with small completed family sizes. Frequency distributions of family sizes for populations of 1,000 reveal that 1.60 per cent of always monogamous women would have had families smaller than four while none had but one child. Similarly, of initially-monogamous first wives in two-wife families, 1.69 per cent would have had families smaller than four; and, although

0.80 per cent would have had but one child, none would have had two-children families.

By comparison, although in the remaining categories only second wives in three-wife families had but one child, 5.62 per cent of initially-monogamous first wives in one-wife families would have had completed family sizes of either two or three children while 6.90 per cent of third wives in three-wife families would have had completed families of three children, as would have 3.60 per cent of wives either of higher ordinal status or in families with a larger number of wives. Although the number of wives was small, no initially-monogamous first wife in a three-wife family had as few as four children, as can be observed in Table 57.

Relative to initially-monogamous first wives in two-wife families, within each category a greater proportion ceased or had ceased childbearing at each consecutive parity. This was also true of monogamous women through the eleventh parity after which greater proportions of initially-monogamous first wives in two-wife families terminated childbearing. The proportions of second wives in two-wife families failing to bear children in each successive parity were somewhat greater relative to second wives in three-wife families through seventh parity. First wives in three-wife families who had mean fertility equal to second wives achieved such by concentrating completed family sizes around the mean. Wives of third and greater ordinal status ceased childbearing in larger proportions at each parity relative to other wives.

Table 56. Parity Progression Ratios by Selected Ordinal Status and Average Number of Wives Present for Polygynous Women Married at Ages 17 through 21 and Continuously Married through Age 46

	Ordinal Status and Average Number of Wives Present							
		First Wife Initially Monogamous	First Wife Initially Monogamous	First Wife Initially Monogamous	Second Wife	Second Wife	Third Wife	Third Wife and Greater
Parity	Always Monogamous Wife	One-Wife Family	Two-Wife Family	Three-Wife Family	Two-Wife Family	Three-Wife Family	Three-Wife Family	Four-Wife and Greater Family
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	1.000	1.000	.992	1.000	1.000	.974	1.000	1.000
2	.998	.972	1.000	1.000	1.000	1.000	1.000	1.000
3	.986	.971	.991	1.000	.962	1.000	.931	.964
4	.992	1.000	1.000	1.000	.961	.974	.963	.926
5	.975	.941	.991	1.000	.932	.946	.923	.960
6	.960	1.000	.974	1.000	.882	.886	.875	.875
7	.940	.938	.937	1.000	.917	.903	.762	.857
8	.877	.867	.914	.500	.909	.857	.813	.722
9	.807	.923	.790	1.000	.700	.750	.615	.923
10	.690	.583	.747	.500	.743	.611	.750	.667
11	.546	.571	.589		.615	.727	.167	.625
12	.540	.125	.394		.375	.375		.400
13	.361	1.000	.385		.167	.333		
14	.546		.400		1.000			
15	.417		.500					
16	.400		1.000					
17	1.000							

Table 57. Projected Family Sizes for 1000 by Selected Ordinal Status and Average Number of Wives Present for Polygynous Women Married at Ages 17 through 21 and Continuously Married through Age 46

Family Size	Ordinal Status and Average Number of Wives Present							
	Always Monogamous Wife		First Wife Initially Monogamous One-Wife Family		First Wife Initially Monogamous Two-Wife Family		First Wife Initially Monogamous Three-Wife Family	
	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage
1					8	0.80		
2	2	0.20	28	2.80				
3	14	1.60	28	5.62	9	1.69		
4	8	2.38						
5	24	4.82	56	11.19	9	2.58		
6	38	8.63			25	5.11		
7	55	14.11	55	16.69	60	11.09		
8	106	24.68	111	27.77	76	18.73	500	50.00
9	145	39.21	55	33.33	171	35.80		
10	189	58.06	278	61.13	162	52.04	250	75.00
11	190	77.10	167	77.81	198	71.75	250	100.00
12	105	87.63	194	97.23	171	88.87		
13	79	95.54			68	95.71		
14	21	97.56	28	100.00	26	98.29		
15	14	98.98			8	99.14		
16	6	99.59						
17					9	100.00		
18	4	100.00						
Total	1000		1000		1000		1000	

Table 57. (continued)

Family Size	Ordinal Status and Average Number of Wives Present							
	Second Wife Two-Wife Family		Second Wife Three-Wife Family		Three Wife Three-Wife Family		Third Wife and Greater Four-Wife and Greater Family	
	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage	N	Cumulative Percentage
1			26	2.60				
2								
3	38	3.80			69	6.90	36	3.60
4	38	7.55	25	5.13	34	10.34	71	10.73
5	62	13.84	52	10.25	69	17.25	36	14.30
6	102	24.00	102	20.49	104	27.59	107	25.02
7	63	30.31	77	28.20	172	44.82	107	35.74
8	64	36.65	103	38.47	103	55.14	179	53.60
9	190	55.66	153	53.85	173	72.41	36	57.18
10	114	67.05	180	71.80	69	79.31	142	71.44
11	126	79.74	77	79.50	172	96.54	107	82.15
12	127	92.40	128	92.31	35	100.00	108	92.86
13	63	98.73	51	97.44			71	100.00
14			26	100.00				
15	13	100.00						
16								
17								
18								
Total	1000		1000		1000		1000	

As a result of differing rates of cessation of childbearing, by ninth parity, 35.80 per cent of initially-monogamous first wives in two-wife families had terminated or terminated childbearing as had 39.21 per cent of always monogamous women and 33.33 per cent of initially-monogamous first wives in families averaging one wife. In comparison, 50.00 per cent of first wives in three-wife families had no more than nine children as was true of 55.66 per cent of second wifes in two-wife families and 53.85 per cent of second wives in three-wife families. In addition, 72.41 per cent of third wives in three-wife families had completed family sizes smaller than 10 as did 71.44 per cent of wives of higher ordinal status and in families with larger average numbers of wives present.

In addition to ceasing childbearing at lower proportions, women with higher mean fertility continued to bear children into later parities. Maximum parity ranged from 11 children for first wives in three-wife families to 18 children for always monogamous wives. In addition, initially-monogamous first wives in two-wife families experienced as many as 17 confinements while second wives in two-wife families experienced 15.

6.6:4 The Effects of Ordinal Status and Average Number of Wives Present on Fertility

Controlling for ordinal status of a wife and the average number of wives present throughout a wife's marriage disclosed that significant differences between polygynous and monogamous fertility were related to both ordinal status and average number of wives present.

However, it was not until a wife was of third ordinal status and in a marriage averaging three wives throughout that significant differences obtained.

In addition, although where significant fertility differences existed both mean protogenetic and intergenetic birth intervals were longer than were monogamous mean intervals, these differences per se cannot account totally for the fertility differential. Concomitant with somewhat greater mean birth intervals, and more significant in depressing mean fertility, were greater proportions of small families, cessation of childbearing at earlier parities and in greater proportions, and a failure to continue childbearing into parities as high as for those with higher fertility. So that, although during the time these women were bearing children they were doing so at only somewhat greater intervals between than were monogamous women, they tended to terminate childbearing at earlier parities.

It is plausible that an ordinal status of three or greater in combination with an average number of wives present of three or greater could, in themselves, increase the mean length of the birth interval somewhat by reducing coital frequency. However, these, per se, do not account for women married at ages 17 to 21 inclusive ceasing childbearing at earlier parities than their counterparts of lower ordinal status and in families with fewer wives present.

Consequently, other factors which might conceivably contribute to cessation of childbearing at earlier parities need to be sought. As was found in Chapter 5, extreme age differences between spouses, particularly where the difference was as great or greater than 20 years, depressed fertility. Moreover, although significant differences between mean birth intervals were absent, as age gap increased, the parity at which childbearing ceased generally decreased and the rate at which it decreased was greater.

6.7 Possible Explanation for Fertility Differences

As there generally was a time lag between a husband's taking each successive wife, it is to be suspected that as the ordinal status of wives increased the age gap between husband and wife would also increase so that a greater proportion of those of higher ordinal status would be married to men of advanced age. An examination of age differences between husband and wife by selected ordinal status and average number of wives present for women married between ages 17 and 21 inclusive revealed that a positive relationship existed.

Of initially-monogamous first wives in one-wife and three-wife families, an age difference as great as 10 years between them and their spouses did not exist. The mean age difference for these two categories was 4.04 years and 3.04 years respectively. Similarly, of initially-monogamous first wives in two-wife families, 91.45 per cent were either older than their husbands or up to 10 years younger than they. (This is the only category under consideration in which wives, 6.84 per cent, were older than husbands.) Moreover, only 2.56 per cent were as much as 15 to 20 years younger, and none was more than 20 years her husband's junior. The mean age difference between these women and their spouses was 4.7 years.

As ordinal status increased to second wife, the age gap between husband and wife increased accordingly. By contrast with initially-monogamous first wives, few second wives, approximately 7.5 per cent, were as little as 5 years younger than their husbands. Of second wives in two-wife families, 26.71 per cent were 10 to 15 years younger and 22.78 per cent were 15 to 20 years younger than the husband. While no initially-monogamous first wife was as much as 20 years younger than her spouse, 15.19 per cent of second wives in two-wife families and 7.69 per cent of those in three-wife families were. In addition, the mean difference in ages between spouses was 14.00 years and 13.45 years respectively.

As was to be expected, although no third wife in a three-wife or four-wife family was as little as 5 years younger than her spouse, there were third wives who were over 30 years younger. Third wives in three-wife families were, on the average, 19.57 years younger, and those in four-wife families were 17.79 years younger than their husbands. Granted the number of wives of fourth and fifth and greater ordinal statuses, regardless of the average number of wives present, is small. Nevertheless, the mean age gap between husband and wife again exhibited an increase. Fourth wives experienced an age gap of 23.06 years, and wives of fifth and greater ordinal status were, on the average, 25.73 years younger than their spouses. The mean age gap for the combined category of third wives in four-wife families, fourth wives in four-wife families, and fifth or greater wives in families of five or more was 21.38. None in the latter two aggregates of this category was as little as 15 years the husband's junior.

Comparing fertility by ordinal status and average number of wives present with the mean age differences between spouses reveals that age difference appears to be related to fertility. Initially-monogamous first wives in one-wife and two-wife families, those having the highest mean fertility, were also, generally, of the same age cohort as their husbands. The lower fertility of initially-monogamous first wives in three-wife families, however, may be a consequence of either the average number of wives present or the small numbers in this category. Nonetheless, the numbers (N=12) are too small to be meaningful.

Second wives, whose mean fertility was less than that of initially-monogamous first wives in two-wife families by more than 1.0, had the same fertility regardless of whether there were two or three wives present. Moreover, the mean age difference between spouses was also essentially the same--14.00 years and 13.45 years, approximately 10 years greater than for initially-monogamous first wives in two-wife families.

Mean fertility again declined by approximately 1.0 with the third and greater ordinal statuses, so that women of third ordinal status and higher experienced, on the average, approximately 2.5 fewer births than initially-monogamous first wives in two-wife families. Furthermore, the average age difference between husband and wife for women of third or greater ordinal statuses was 20 years to 25 years, approximately 15 to 20 years greater than for initially-monogamous first wives in two-wife families.

As differential length of birth intervals contributed only somewhat and earlier cessation of childbearing was the major factor in the lower fertility of women of higher ordinal status married between ages 17 to 21 inclusive relative to their counterparts of lower ordinal status, it is plausible that the above differences in age between spouses is the significant factor in depressing polygynous fertility. Moreover, the age differences could also conceivably account for the small differences in the mean length of birth intervals.

However, it is to be questioned whether it was the age difference between husband and wife per se rather than the advanced age of the husband, which itself caused the age gap, which was responsible for depressing fertility. Women marrying at ages 17 to 21 and marrying men 20 to 25 years their senior would be marrying men 37 to 46 years of age on the average at the time of marriage. Although these were by no means elderly men, by the time these women had attained the age of 35 years, their husbands would be 55 to 60 years of age.

It is reasonable to expect that at this age, if not before, if the sperm count had not declined, the male's sex drive had been diminished somewhat and his physical capacity to maintain a coital rate comparable to his younger counterparts had been reduced. A significant reduction in any or all of these, however, would not explain the fertility differences as these would not result in an abrupt cessation of childbearing.

However, as the likelihood of a woman's being widowed with young children to rear in a frontier society increased with the increasing age of the husband, it is not unlikely that a rational decision was made at an earlier parity to voluntarily cease childbearing. As nineteenth-century Mormons believed in intercourse for reproductive purposes only and not for the pleasures of the flesh, voluntary abstinence would be an acceptable practice. Moreover, not bearing future children who could not be cared for adequately was justifiable. As fertility differentials are a consequence of cessation of childbearing, it is likely these differences were due to this latter factor. However, the earlier factors associated with the husband's advanced age and declining sexual activity could have contributed to the somewhat lengthier mean birth intervals.

Why women who were initially-monogamous first wives in two-wife families had somewhat higher fertility than initially-monogamous first wives in one-wife families is more difficult to explain on the basis of age differences between spouses. It is possible that the lower fertility of first wives in one-wife families, 0.76 lower than for their counterparts in two-wife families, may be due to other factors.

In examining the marriage patterns of first wives in one-wife families, it was found that 14, or 38.89 per cent, resumed a monogamous status later in their marriages. These women spent, on the average, just 26.14 per cent of their married lives in polygyny before resuming a monogamous status. It is possible, as all polygynous unions were not successful, that the resumption of a monogamous status for a large proportion of these women was due to the husband's divorcing the polygynous spouse. It is also probable that, if this were the case, marital discord preceded the divorce, and it is again probable that this marital discord led to a significant reduction in, if not cessation of, sexual relations which temporarily affected the fertility of first wives. It is not inconceivable that the divorce was at the insistence of the first wife.

In addition, it has been speculated that husbands married a second wife when the fertility of the first wife was low. As the remaining 23 wives in this category were in polygynous unions for only an average of 36.30 per cent of their married lives, it is possible that their polygynous status resulted from their lower fertility and that their husbands did not take a polygynous wife until later in the marriage when the wife's lower fertility was obvious.

However, when the completed family sizes for each of these women in the two sub-categories were examined, it was found that only two women in the first category, those who resumed a monogamous status, had extremely small families relative to the norm--one family of 3 children and another of but 5. In the latter category, three women had such small completed families of 2, 4, and 5. When the small families were removed from the calculations, mean fertility was 10.42 and 10.45 respectively.

Therefore, it appears that the differences between initially-monogamous first wives in one-wife families and initially-monogamous first wives in two-wife families are a function of small numbers in the former category and not due to real differences. The effects of a few extremes on the mean in the former category succeeded in reducing the mean by 0.80. Consequently, fertility appears to be the same for initially-monogamous first wives who are of the same age cohort as their husbands.

From the above findings, it appears that for women married between the ages of 17 and 21 years inclusive ordinal status and the number of wives present in the marriage are not the significant factors in depressing polygynous fertility. Although there appears to be an inverse relationship between ordinal status and fertility, I think it is safe to say that this is a spurious relationship as high ordinal status is concomitant with the advanced age of the husband. An earlier cessation of childbearing, and not lengthier birth intervals, results in depressed fertility, and it appears that this earlier cessation is a consequence of the husband's advanced age. However, this too may be a spurious relationship.

The numbers of second wives in two-wife and three-wife families are sufficiently large to permit a breakdown by age difference between husband and wife. When this was done, it was found that second wives who were 10 to 15 years their husbands' juniors had a standardized mean fertility of 9.05. Moreover, if the advanced age of the husband alone is the variable which depresses fertility, it is to be expected that monogamous wives experiencing the same age gap would have the same fertility. However, this was not the case. Instead, monogamous wives had a standardized rate 1.45 greater than that of second wives. In addition, computing the mean fertility for wives 15 to 20 years younger than their spouses revealed that the standardized rate for second wives was 9.11 compared to 9.85 for always monogamous wives. However, the numbers in both categories are too small to be significant.

Unfortunately, a more detailed analysis of the effects of age differences between husband and wife is not possible at this time due to the small numbers of women of higher ordinal status.

CHAPTER 7

SUMMARY AND RECOMMENDATIONS FOR FURTHER RESEARCH

Within every society exist numerous variables which affect fertility, either by enhancing it or by depressing it. Although intercourse, conception, gestation, and successful parturition are the direct biological factors affecting fertility, many intermediate sociological variables, both independently and in interaction, affect the degree to which these occur, as has been discussed at length by Davis and Blake (1955-56). Polygyny, by the very nature that it includes more than one female, is but one of those variables which has been viewed as affecting the rate of exposure to intercourse. Other attendant features of polygynous unions are believed to also affect exposure to both intercourse and conception.

This dissertation has attempted to explore whether or not polygynous marriages relative to monogamous marriages depress fertility in a population in which natural fertility was believed to prevail (thus eliminating the depressing effects of contraception) and coital restricting customs are assumed to be absent (thereby eliminating some sociological factors which may in themselves act to depress fertility).

Moreover, previous studies of fertility differentials between monogamously and polygynously married women have tended to overlook the ordinal status of the polygynous wife, the average number of wives present during her fecund married years, and the percentage of a wife's fecund married years spent in a polygynous union. If the polygyny-fertility hypothesis is correct in proporting that polygyny reduces exposure to sexual intercourse, then, as the dimension of each of these variables increases, the exposure to sexual intercourse will decrease and fertility will, therefore, decline. This dissertation has, therefore, examined these three variables peculiar to polygynous unions in an attempt to determine whether or not they in fact produced differential fertility within polygynous unions and, if so, to what extent.

Data for the study were obtained from Family Group Record Sheets of Mormon females who were married between 1840 and 1885, who resided within the confines of the "State of Deseret" for at least one-half their married lives, and who were married under covenant during the birth of at least one-half their children. All women in the sample were fertile, and no data are available on the proportion in the population who were childless. Moreover, the portion of the sample used primarily throughout the study consisted of women who had been continuously married through age 46. As the data are derived from genealogical records, they are for completed family sizes. These genealogical records were obtained from the L.D.S. Church Genealogical Archives, Salt Lake City, Utah.

To begin with, although it is assumed that this sample of nineteenth-century Mormon women was adhering to the ecclesiastical proscription regarding fertility limitation and that natural fertility did in fact obtain, the nature of the sample prohibits direct verification. In order to avoid attributing possible fertility differences between the two samples to differential usage of fertility limitation, it was felt that it was necessary to be able to state with more assurance that a condition of natural fertility existed.

As it is known that the Hutterite women studied by Eaton and Mayer (1953) and by Sheps (1965-66) were non-contracepting and that natural fertility did prevail, the mean fertility and mean birth interval lengths of Mormon women continuously married in monogamous unions through age 46 were compared with those found for Hutterite women in the two studies cited above.

This comparison revealed that, although monogamous Mormon women married at somewhat younger ages and had mean birth interval lengths somewhat longer, most probably a consequence of a longer period of lactation, their average completed family size was very similar to that of Hutterite women. Therefore, it was believed that it could be stated with some assurance that within the monogamous sample, and most probably within the polygynous sample as well, natural fertility did prevail and that differential use of fertility limitation could be eliminated as a possible source of differential fertility, if it obtained, between the samples.

Secondly, as the majority of previous studies of the polygyny-fertility hypothesis have been able to control for either no variables or only a few due to the inadequacy of the data, a similar calculation was made in this instance to provide a basis for comparison to see the effect on mean fertility when variables were controlled for. When controlling for no variables, such as age at marriage, duration of marriage, continuity of marriage, and so forth, monogamous women were found to have a mean fertility of 9.42 compared to 8.27 for polygynous women, a difference of 1.15 children. When discontinuous unions were selected out, mean fertility was altered but little, being 9.44 for monogamous women and 8.26 for polygynous women.

Although the numbers were small, always monogamous women in discontinuous unions were found to have had, on the average, 8.63 children while all other women in discontinuous unions, of which at least one was polygynous, had a mean fertility of 8.31, a difference of 0.32.

Thirdly, the mean fertility of only those women continuously married through age 46 was calculated. It was found that monogamous women had an average of 9.97 children. By contrast, the mean fertility of all polygynous women similarly married was 8.70, this being 1.17 fewer children than for monogamists. So that, by removing those in discontinuous unions and those not married throughout their fecund years from the calculation increased mean fertility somewhat, it did not alter the fertility differences between polygynous and monogamous women.

For women continuously married through age 46, differing ages at marriage result in differential periods spent at risk and, thereby, may affect fertility. All things being equal, it is to be expected that women at risk for longer periods would have higher fertility than those at risk for shorter periods. If two populations experienced differing patterns of age at marriage, this in itself could result in differing fertility levels.

Most previous studies of this nature have either been unable to control for age at marriage due to inadequate data or have overlooked this factor. Smith and Kunz (1976), for example, in their study of Mormon polygynous and monogamous fertility, assumed that age at marriage between these two groups of women would be insufficiently different to warrant controlling for. However, when examining age at marriage for the two samples in this study, it was found that polygynously married women married at both younger and older ages than did monogamously married women, who concentrated age at marriage around the mean. Consequently, standardization was used to reduce the effect of age-compositional bias. When this was done, polygynous fertility increased to 9.16. As a result, the difference between the fertility of monogamous and polygynous Mormon women continuously married through age 46 was but 0.81, not a large difference in view of the average family size.

Fourthly, monogamous and polygynous fertility by marriage cohort was calculated in order to determine whether or not fertility differences obtained between cohorts and/or between the two marriage types within cohorts.

It was discovered that within both the monogamous and the polygynous samples fertility declined somewhat with each successive marriage cohort. However, fertility declined much more rapidly for polygynous women, particularly for those marrying between 1868 and 1877. However, this can probably be viewed as an attendant effect of the intensification of federal prosecutions for illegal cohabitation. Nevertheless, fertility differences between monogamous and polygynous women by marriage cohort were approximately 0.9 until the 1868 to 1877 cohort where the difference was as great as 1.60.

Polygynous fertility recovered somewhat for those married between 1878 to 1885 while monogamous fertility continued to decline somewhat for this cohort. As a result, the fertility difference between the samples married in 1878 to 1885 was 1.35. However, as a result of the sharp decline in fertility for polygynous women in the 1868 to 1877 marriage cohort and the only slight recovery in the next cohort, fertility had declined by 1.18 between the cohort married between 1848 to 1857 and that married between 1878 to 1885. By contrast, monogamous fertility declined by 0.77 between the 1848 to 1857 cohort and the 1878 to 1885 marriage cohort.

Finally, as it has been postulated that a greater proportion of polygynous women would be married to men of advanced ages and that this in itself would tend to reduce their fertility, age differences between spouses was examined.

An analysis of age differences between husband and wife revealed that a much greater range of differences existed for those polygynously married than for those monogamously married. Moreover, in those categories where age differences between spouses were greatest, the numbers of monogamous wives were relatively small. Consequently, it was impossible to compare the fertility of polygynous and monogamous wives in all possible categories.

In addition, because of the effect of the wife's age at marriage on fertility, the fertility of only those women married between the ages of 17 and 21 was examined. Standardization showed that no fertility difference existed between polygynous and monogamous women who were 0 to 10 years their husbands' juniors. Beyond these age differences, however, monogamous fertility fluctuated. For women 10 to 15 years younger than their husbands, fertility increased so that it was greater than that of women 0 to 10 years younger than their spouses, and then it decreased somewhat for women 15 to 20 years younger than their husbands so that it was similar to that of women 0 to 10 years their husbands' juniors. Meanwhile, the fertility for polygynous females decreased and continued to decrease as the age gap between husband and wife widened. As a result, the fertility of polygynous women 10 to 15 years younger than their husbands was depressed 1.56 relative to their monogamous counterparts and those married to men 15 to 20 years older was 1.12 lower than for monogamous wives. As few monogamous women were married to men more than 20 years their senior, a comparison of their fertility with that of polygynous wives married to men that much older than they could not be made.

A comparison of all monogamous women with all polygynous wives generally and by marriage cohorts revealed that polygynous fertility was depressed by approximately 1.0 relative to monogamous fertility. However, when differences between the age of husband and wife were examined, it was found that where husbands were from 0 to 10 years older than their wives, there was no difference between the fertility of monogamous and polygynous women.

Although mean fertility between polygynous and monogamous women was not significantly different, factors peculiar to polygynous unions were analyzed to determine whether or not these factors depressed fertility further.

In analyzing the effects of these factors--percentage married years polygynous, ordinal status of the wife, and average number of wives present in a marriage--the mean number of birth events was equated with mean fertility. Mean number of birth events was also used when analyzing cohort fertility and fertility by age differences between husband and wife. The mean number of birth events for always monogamous wives was 9.71.

To begin with, it has frequently been hypothesized that there is an inverse relationship between percentage of time spent in polygynous unions and fertility. However, an examination of this variable revealed that, excepting for those exclusively in polygynous unions, percentage of time had little effect on fertility. The fertility of those exclusively polygynous was depressed by somewhat over 1.0 relative to the remainder and by 1.31 relative to always monogamous wives.

Moreover, it was discovered that the percentage of married years spent in polygynous unions was highly correlated with ordinal status. Obviously, no initially-monogamous first wife (the vast majority of first wives) could be 100 per cent polygynous, so that those who were were of second or greater ordinal status. Moreover, few of third or greater ordinal status spent less than the entirety of their married years in polygyny.

The examination of ordinal status revealed that initially-monogamous first wives had a standardized mean fertility of 9.71, identical to that of always monogamous wives. Thereafter, polygynous fertility declined steadily with each successive ordinal status until there was a fertility difference of 3.64 between wives of fifth and greater ordinal status and always monogamous wives.

An analysis of the third variable peculiar to polygyny, average number of wives present, revealed basically the same pattern as above. Wives in families averaging but one wife had a standardized fertility rate of 9.60, 0.11 lower than for always monogamous wives. From this point forth, fertility declined by approximately 1.0 with each successive increase in the average number of wives present until fertility was 3.08 lower, where there was an average of five or more wives present, than for always monogamous women.

An examination of ordinal status and percentage years polygynous showed that initially-monogamous first wives in polygynous unions for 75 to 99 per cent of their marriages had the highest mean fertility, 9.88, 0.17 higher than for always monogamous wives. Although the fertility of other initially-monogamous first wives was lower, there was no consistent pattern of decrease with declining years in polygyny. However, the few initially-monogamous first wives who were in polygynous unions for less than 25 per cent of their married lives had a mean fertility of 9.00.

By contrast, second wives who were exclusively polygynous had a mean fertility of 8.26, 1.45 lower than the fertility of always monogamous wives. Mean fertility levels continued to decline with increasing ordinal status so that those who were 100 per cent polygynous and were of fifth or greater ordinal status experienced a mean fertility 4.40 lower than that of always monogamous women.

The examination of fertility by average number of wives present and percentage of years polygynous showed that those who were 75 to 99 per cent polygynous in families in which there were two wives on the average had the highest mean fertility at 9.75, again almost identical with that for always monogamous women. Wives in families which averaged one wife and who spent between 25 to 49 per cent of those married years in polygyny had second highest fertility, it being 9.44.

Although there was no pattern of increasing or decreasing fertility relative to average number of wives present and percentage of time polygynous, within each percentage-of-years-polygynous category, as average number of wives present increased fertility decreased. Those with lowest mean fertility, 5.90, were exclusively polygynous and living in families with an average of five or ore wives present.

The analysis of fertility by ordinal status and average number of wives present revealed that highest fertility was experienced by initially-monogamous first wives in two-wife families followed by initially-monogamous first wives in one-wife families. However, the fertility of initially-monogamous first wives in two-wife families was virtually identical with that of always monogamous wives. While second wives in three-wife families had somewhat higher fertility than second wives in two-wife families, 8.41 compared to 8.27, second wives in two-wife and three-wife families had a mean fertility 1.44 and 1.31 lower than that of always monogamous women.

As ordinal status and average number of wives present increased, fertility declined by approximately 1.0 with each successive category so that wives of fifth and greater ordinal status in families averaging five or more wives had a mean fertility of 5.82, 8.89 lower than that of monogamists.

Because of the effect of the wife's age at marriage on fertility, fertility by ordinal status and average number of wives present was calculated for women married between the ages of 17 and 21 only. It was calculated as well for monogamous wives marrying at these ages. As most aggregates were small, less than 25 women, only those with sufficiently large numbers were considered.

Computations for this select group revealed that women who were initially-monogamous first wives in two-wife families experienced mean fertility of 10.38 compared to 9.93 for their always monogamous counterparts, somewhat but not significantly higher. Initially-monogamous first wives in one-wife families had a mean fertility of 9.62. The fertility of second wives was somewhat lower than that of first wives in one-wife families. Second wives in two-wife and three-wife families had a mean fertility level of 9.00 and 9.05 respectively. Fertility decreased to 7.90 for third wives and wives of greater ordinal status, two children fewer than for monogamous wives.

It appears from the above findings that as ordinal status increased from first, and to a small extent as average number of wives present increased, fertility decreased. It would appear that after second ordinal status, fertility was depressed by one child with each successive status. On the surface, it would appear that the polygyny-fertility hypothesis had been supported. However, if this were the case and fertility did decline as a result of lower coital frequency per wife resulting from the larger number of wives in the union, significant differences would be found in the mean length of birth intervals.

Throughout this study, however, wherever fertility differentials have occurred, mean length in birth intervals has generally failed to account for them. In fact, it was found that the greatest differences in birth interval lengths occurred between protogenetic intervals and that little or no difference was generally found between the intergenetic intervals.

In examining the birth intervals by ordinal status and average number of wives present for women married between the ages of 17 and 21, it was found that the mean protogenetic birth interval for always monogamous wives was 14.31 months and that the same interval was somewhat shorter for initially-monogamous first wives in one-wife and two-wife families. Moreover, second wives in three-wife families had a protogenetic interval just 2 months longer, while wives of higher ordinal status had first birth intervals just over 5.5 months longer.

In addition, the mean intergenetic interval for monogamous wives was 28.59 months, again somewhat longer than for initially-monogamous first wives in two-wife families. However, the means for all other categories were no more than 2.5 months greater than was the mean for always monogamous wives.

Consequently, it was found that differential birth interval lengths could not account for the fertility differences. Differential birth interval lengths could account for less than 50 per cent of the fertility difference between second wives and always monogamous wives.

While they could account for just over 40 per cent of the fertility difference between third wives in three-wife families and monogamous wives, they could account for only 21 per cent of the fertility difference for wives of greater ordinal status in larger families.

Therefore, if there indeed existed, as has been hypothesized, an inverse relationship between ordinal status, average number of wives present, and percentage of married years polygynous and coital rates, then depressed coital frequency had little or no effect on the length of birth intervals and, therefore, little or no effect on fertility. As conception can occur only during a brief period each month, the frequency of intercourse seems to be not as important a factor as is the timing of intercourse, that is, at the time of ovulation.

As a result of the above findings, parity progression ratios and projected family size distributions for populations of 1,000 were constructed. In the analysis of other variables, it was found that as fertility declined the parity at which childbearing ceased also declined and the proportion ceasing childbearing at these earlier parities increased. Moreover, as fertility declined, the parity range also tended to narrow. However, in these earlier parity progression ratios, all polygynous women were considered, so that the differential rates at which childbearing ceased might be attributed to differential age composition.

In this sub-sample, however, women were of the same age group and no woman married before the age of 17 or after the age of 21 was included. In spite of this control, an examination of the parity progression ratios and projected family size distributions produced the same results--as fertility declined childbearing was terminated at earlier parities and at higher proportions and the parity range narrowed.

It is unlikely that women who were of higher ordinal status and who had been bearing children at generally the same rate as those of lower ordinal status would experience a cessation of childbearing at earlier parities because of decreased coital rates. It is more likely that coitus itself was terminated.

As the only other variable examined in which monogamous and polygynous fertility was identical in some categories was difference in age between husband and wife, these were examined by ordinal status.

Controlling for age differences showed a high correlation between ordinal status and age differences between husband and wife. The mean age difference for initially-monogamous first wives was less than 5 years, while that for second wives was approximately 14 years. Third wives were, on the average, between 18 and 19 years younger than their husbands, while fourth and fifth wives were approximately 23 and 26 years, respectively, their husbands' juniors.

It would appear that the difference in age between husband and wife, and more specifically the age of the husband, rather than the ordinal status of the wife depressed fertility. However, because of the small numbers of those of higher ordinal status, cross tabulation by age difference and ordinal status would produce categories too small for significant analysis. Consequently, it is a bit premature to assert positively that the age of the husband is the significant factor in depressing the fertility of polygynous women of high ordinal status.

However, in spite of the appearance of the husband's age as the significant variable depressing fertility, there is still an unaccounted for factor. The numbers of second wives in two-wife and three-wife families married exclusively in polygynous unions were sufficiently large to permit analysis by age difference between husband and wife. When this was done, it was found that for those 45 wives who were 10 to 15 years (121 to 180 months) younger than their husbands, mean fertility was 9.18, with a standardized rate of 9.05. If only age difference affected fertility, it would be expected that monogamous wives married at ages 17 to 21 and 10 to 15 years younger than their husbands would have the same fertility as similarly married second wives. Instead, the fertility of these monogamous wives was 1.45 higher. Unfortunately, the fertility differences between where greater age gaps existed could not be analyzed.

Consequently, it may be that the apparent relationship between age difference, actually the age of the husband, and fertility is a spurious one and that age difference is simply highly correlated with the actual variable depressing fertility. Further analysis is required to determine whether or not this is the case.

To begin with, further analysis with sufficiently large numbers of those of higher ordinal status is required so that the husband's age can be analyzed relative to the wife's ordinal status and subsequent fertility.

Furthermore, an explicit norm was never forthcoming from the church hierarchy stating what was an expected or desirable family size. However, it is not unlikely that a norm of ideal family size emerged regarding polygynous families. It is possible, therefore, that as the norm was approximated childbearing ceased. As a result, the fertility of wives of higher ordinal status would be affected by the fertility of preceding wives. Moreover, this would produce a relationship between fertility and the age difference between husband and wife.

It is, therefore, advisable to examine the husband's fertility. For one, the husband's reproductive pattern relative to all his wives should be analyzed to determine whether or not he terminated childbearing activities at approximately the same time (i.e. year) with respect to all of them. In other words, did all childbearing activity cease, irrespective of the wife's ordinal status, when a man reached age 60, for example, or when his fertility reached a certain level.

Moreover, the husband's fertility should be analyzed relative to the number of wives present in a union, the number of wife-years in the marriage, and fertility by ordinal status. The state of the current data does not lend itself to such an analysis.

In view of the above findings, all that can be said at this point is that ordinal status, number of wives present, and percentage years polygynous do not, in themselves, depress fertility by reducing coital rates and increasing the length of the birth intervals. Instead, other as yet unknown variables related to ordinal status and the advanced age of the husband lead to cessation of childbearing at earlier parities.

As the fertility of various groups within a society affects the overall fertility level of that society, mention should be made of the possible effects of polygynous fertility on societal fertility.

Although polygyny tends to reduce the fertility of those polygynous women of higher ordinal statuses, these women comprise a small percentage of the polygynous population and a considerably smaller percentage of all women. Therefore, it is unlikely that fertility levels in those societies in which polygyny is practiced are drastically reduced, if at all, from what they would be if polygyny were absent.

Moreover, as greater proportions of polygynous women marry at age 25 or older than do monogamous women, it may be that polygynous unions provide an opportunity to marry for women who would otherwise never do so. In addition, polygynous unions may provide an opportunity to remarry for those women who have been divorced or widowed. If so, the existence of polygyny may serve to increase societal fertility levels over what they would be if polygyny were absent by decreasing the proportions of single or never-married women in the population.

Therefore, if polygyny were to be eliminated as a marriage form, as is currently being suggested and/or attempted in some African nations, the consequence might be decreasing rather than increasing fertility levels.

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